Vol. XXVI. FEBRUARY, 1895. Number 2.
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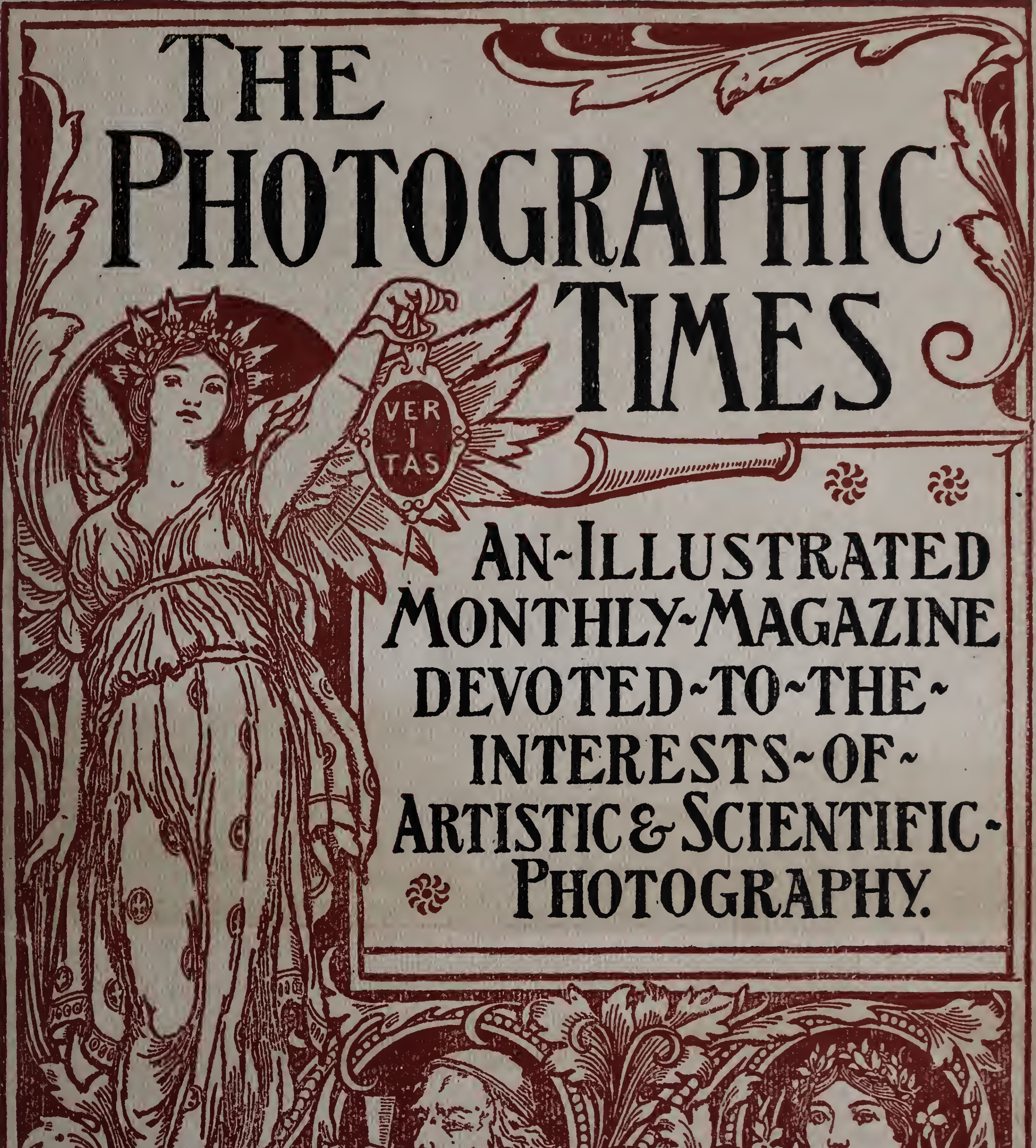

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LONDON, JONATHAN FALLOWFIELD, 146 CHARING CROSS ROAD, W.

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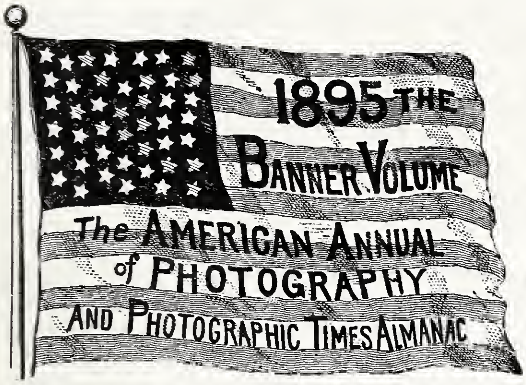

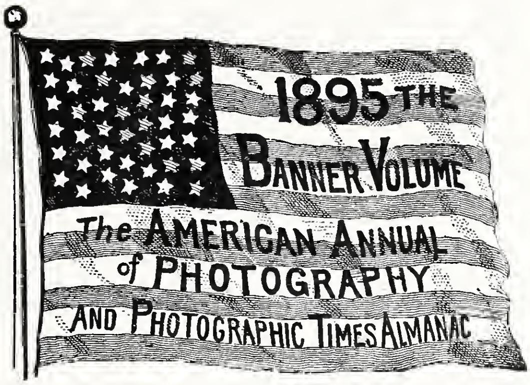

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"**The American Annual of Photography**" for 1895 comes to us this year full of good things, including fine illustrations and many useful suggestions to amateurs and professionals. To amateurs especially "The Annual" is essential in their winter work, with its hints and experiments; its full and new formulæ for development, and instruction in the latest modes of printing and mounting photographs. The issue for 1895 fully equals, if it does not excel, previous "Annuals." Two hundred illustrations are included in the attractions of "The Annual," which is published by the Scovill & Adams Co., New York.—*Public Ledger.*

This "Annual" is a very excellent volume and contains over two hundred illustrations representing many methods and many styles but all very carefully produced. The photogravure "In the Gloaming" is quite worthy of preservation. The contents have been contributed by many of the leading lights in the photographic world, as well as by those less known, and embrace great variety in scope and subject. A review of the year by the editor is interesting in the extreme, the more particularly because of pertinent illustration. Formulas and useful recipes are copious and varied. Tables of interest and value abound, and the list of societies and of photographic dealers make the volume also a good trade work of reference.—*Photography.*

"**The Annual**" for 1895 is, without doubt, a vast improvement over anything yet published in this special line of photographic literature. It eclipses all former efforts not only in its choice of illustrations, which, without few exceptions, are excellent, but in its reading matter. Among the illustrations which adorn its pages one meets with the work of names like Emerson, Bhedwar, H. P. Robinson, Davis and Sanford, Anschütz, Sawyer, Post, Falk, Pancoast, Stieglitz, Sarony, Moreno, Breese, Stern, and a host of others, and as for writers the list comprises even greater names: Bothamley, W. K. Burton, Eickemeyer, Dresser, Gaedicke, Ives, C. Jones, Prof. Lanier, Lambert, Leaming, Dr. Nicol, Pringle, Robinson, Sarony, Schnauss, Prof. Schumann, Traill, Taylor, Prof. Vogel, Waterhouse, etc., etc. In Short the "Annual" is *chuck full* of treats. It is thoroughly up to date in every respect, and its new editor, Mr. Woodbury, is certainly entitled to hearty congratulations from all. He has certainly been instrumental in raising the standard of the "Annual" considerably. It was a "big lift," and will be very difficult to equal in the future. No one ought to be without the *cheapest* fifty cents' worth ever published. The illustrations are worth more than that!—*The American Amateur Photographer.*

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The American Institute of the City of New York,
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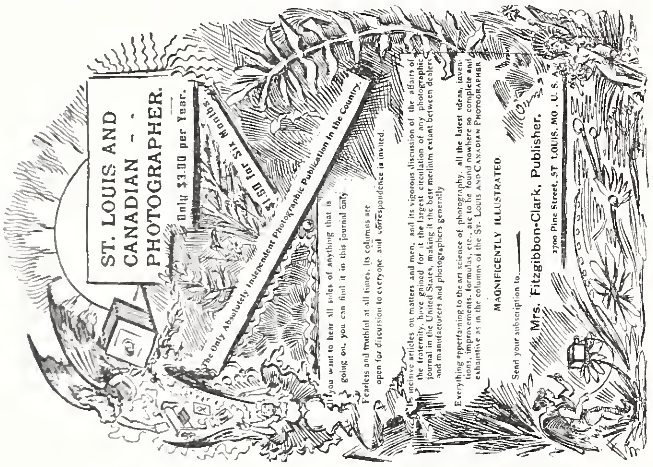

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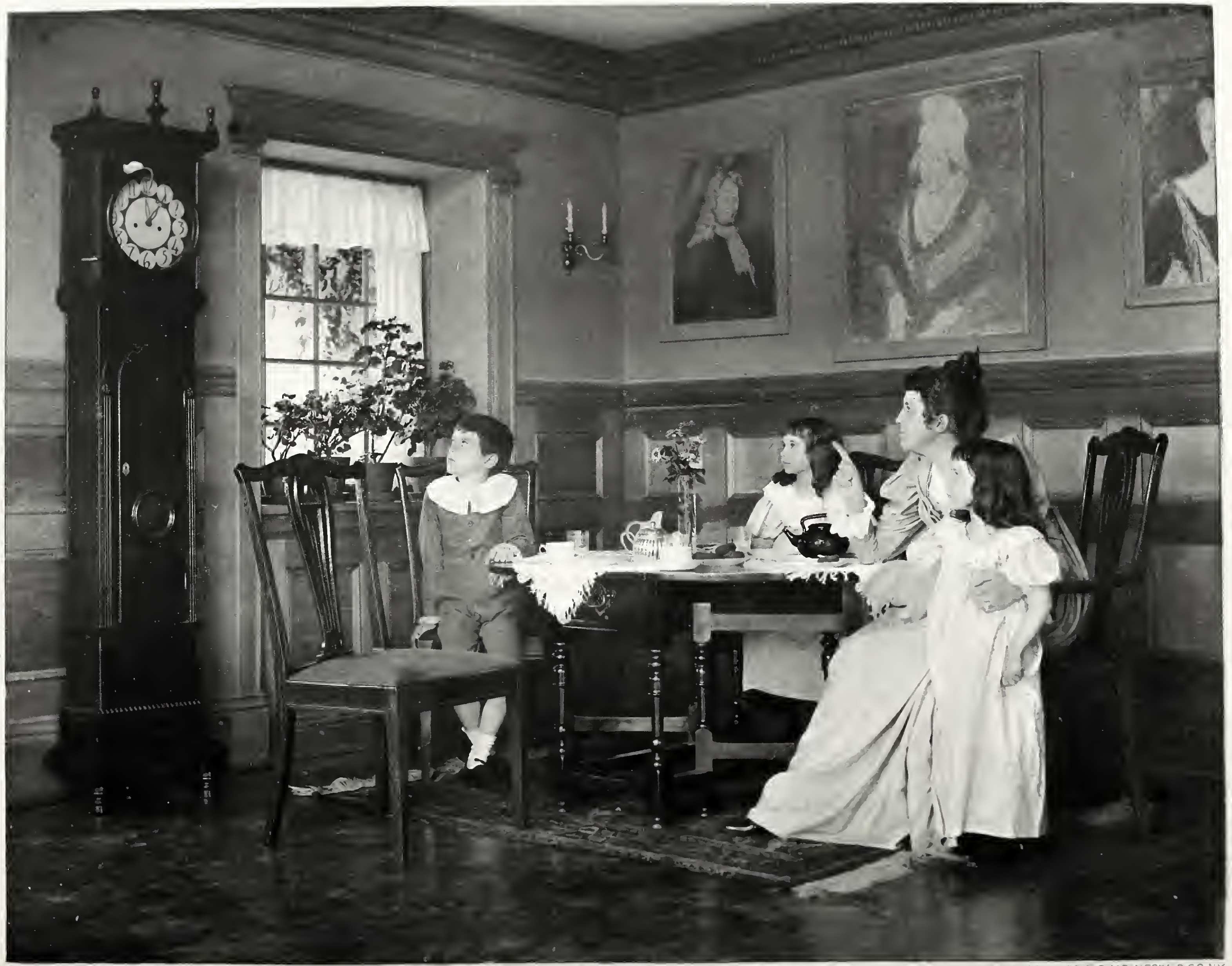

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"HICKORY, DICKORY, DOCK,
THE MOUSE RAN UP THE CLOCK!"

THE PHOTOGRAPHIC TIMES.

VOL. XXVI. FEBRUARY, 1895. NO. 2.

THE SKY.

BY H. P. ROBINSON.

FOR the purpose of this article I am afraid I shall have to be uncomplimentary, where I should prefer to praise, but I do not see how to avoid the disagreeable necessity if I am to teach a lesson of any value, and I suppose we all put the advance of our art before any other consideration whatever.

The weak point, then, in American landscape photography, if one may judge by the specimens that come over the water as illustrations in photographic journals and magazines (which it is fair to assume are the best attainable) is undoubtedly the sky.

The subjects of the photographs from which these reproductions are made are often well selected, and are of interesting scenes, but they seldom present more than the raw facts of nature, without any of that delightful harmony of tones and gradations we find in modern photographs by those who have studied nature and represent her as she appears to the eye of the artist rather than to the lens of the scientist. The climate, possibly may have something to do with this (for it is not every country that enjoys such a changeable and artistic atmosphere as we have in England) but not altogether, for we have some fine instances to the contrary. In the salon this year we had a photograph by Mr. Eickemeyer, "Sweet Home," done, I believe, in America, that equaled anything that has been produced in delicacy and observation of subtle gradation. I mention this beautiful little picture as it must be known to many of the readers of THE PHOTOGRAPHIC TIMES.[*] In London its chances of being properly seen were seriously endangered by being sent to two exhibitions at the same time—which sounds paradoxical, but is true. Fancy this picture with a white sky! The result would be another specimen of rawness and crudity of which we have already far too many. I hope I may be forgiven for saying that there is danger to the art in showing and praising specimens of immature photography. The prominence given them by reproduction invests them with a fictitious value which is misleading, for young beginners cannot help taking them for examples to follow, instead of to be avoided.

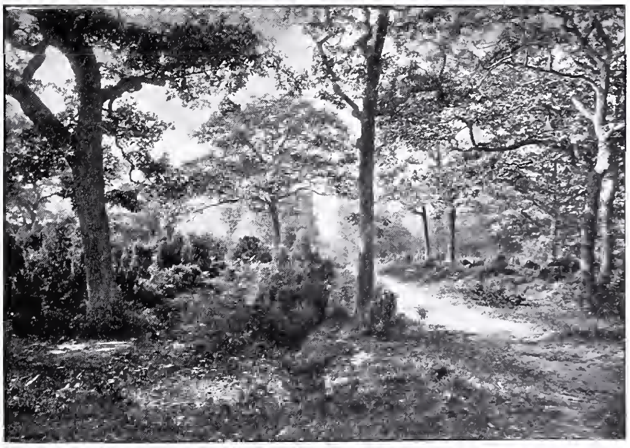

FIGURE 1.

Yet many a crude result may be turned into

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[*] It will be found upon another page of this magazine.

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a success if the operator would try to understand, and act on the knowlege, that in almost every case a raw print of a raw negative is not fit to show as an example of what can be done to represent beautiful nature by our art, and if the artist would begin where the chemist left off, or, rather, would do more toward depicting the beauties he ought to see in nature, but are usually unnoticed by the unsympathetic camera; if the photographer would educate his eye to see nature as it is, and not be so ready to believe what the scientific photographer represents as facts, we should soon discover a vast improvement in landscape photography. This matter of the sky is a case in point. The plain, unblushing photograph, the machine-made article, usually represents an ordinary landscape as being backed by a plain white paper sky, and I am not sure that reproduction does not sometimes intensify this effect. Now, white paper represents nothing in this world except a plain space of unsuggestive blankness, and, on the other hand, not one inch of the space it is supposed to represent in a photograph is without tone and gradation. I do not suggest that the sky is never one even tone all over, but in that state it is seldom of much use to the artist, and it *is* tone—not white paper. A plain blue sky, without cloud, is perfectly gradated from the deep blue of the zenith down to the pale horizon.

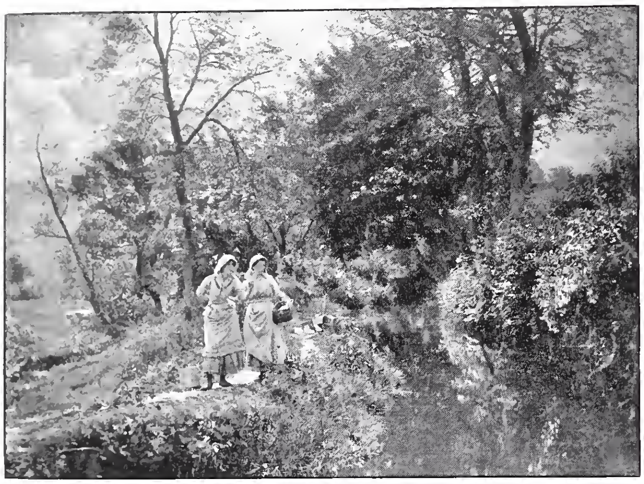

FIGURE 2.

The sky is the one thing that gives expression to nature. It would be a monotonous world without the smiles and frowns of the sky. The artistic possibilities of the clouds are infinite. It is the most valuable element to the photographer; it is the one department of nature which lends itself to the landscape artist, and he neglects it. With a properly selected sky he can alter his composition, and rule his chiaroscuro In short, it is one of the most potent elements to aid him in rescuing his art from the machine.

Given the necessity of a sky, then science interferes. The photographer is usually deluded into endeavoring to discover some method of taking the sky with the landscape, and almost certainly gets into a semi-scientific state of mind which takes more pleasure in conquering a useless chemical difficulty than in obtaining a splendid effect with ease that would give pleasure to the world. Experiment for experiment's sake is the enchanted forest in which many who have grown up into good photographers get mazed and lost.

There are, of course, occasions when it would be advantageous to secure the sky with the landscape on one plate, but they depend upon as many *ifs* as Touchstone's. *If* the lines of the sky compose well with the ground; *if* some other arrangement would not be more conducive to pictorial effect; *if* the sky will come as strong as it is in nature; *if* it can be got without sacrificing the landscape, and a great many other "ifs," then the sky would be better taken on the same plate as the ground, but not otherwise.

Every landscape photographer who would represent nature truly should make a collection of sky negatives for future use, always noting the time of day and of the year, the direction and altitude of the sun, and the aspects of nature at the time each sky negative is taken. Every variety of effect should be secured, and the attention should not be entirely confined to the grandest effects.

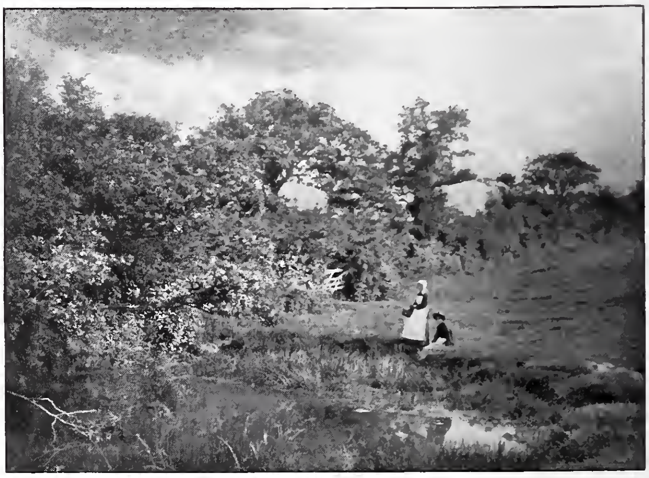

FIGURE 3.

To save those who may be tempted out of the straight path toward art by technical diversions, I will give a full and complete formula,

THE GETTY CENTER
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which will not require any modification whatever, for taking skies, so plain and clear that it should prevent even the weakest photographer from having any frivolous thoughts toward chemical discovery.

Any slow plates, isochromatic preferred.

Shutter exposure.

Pyro and ammonia developer. Formula to be found on any packet of plates.

Patience in developing.

The result should be clean, thin negatives, nearly clear in the cloud shadows.

The method of using a sky negative is so well known as to scarcely bear repetition. When a print is taken the place where the sky ought to be will be white, or if it prints gray the space may be stopped out with black varnish on the back of the plate. Now take a suitable cloud negative, place it in the printing frame, and adjust the print on it so that the sky shall print in the proper place. When exposed to the light the landscape portion should be covered with a black cloth or other suitable mask. Success depends on the care and skill in which any effect of the join is hidden and truth to nature is observed.

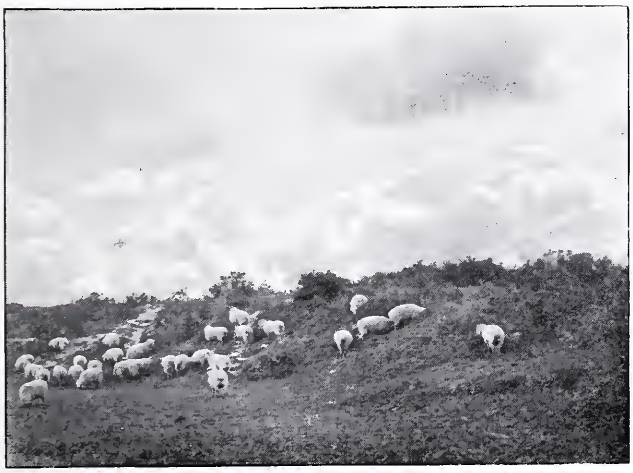


FIGURE 4.

There should not be a bit of plain white space any where about a photograph, except, perhaps, in minute quantity, such as in a figure. There is no such thing in nature. Even in a woody scene, where very little sky shows through the trees, as in Fig. 1, the treatment of the sky makes all the difference between a good picture and an ordinary photograph. It will be noticed in this illustration that the strength of the clouds is very slight, but the various gradations harmonize the different forms and help to concentrate the light. A plain white sky would have *grinned* through the trees. To make the picture complete there ought to be a picturesque figure on the path.

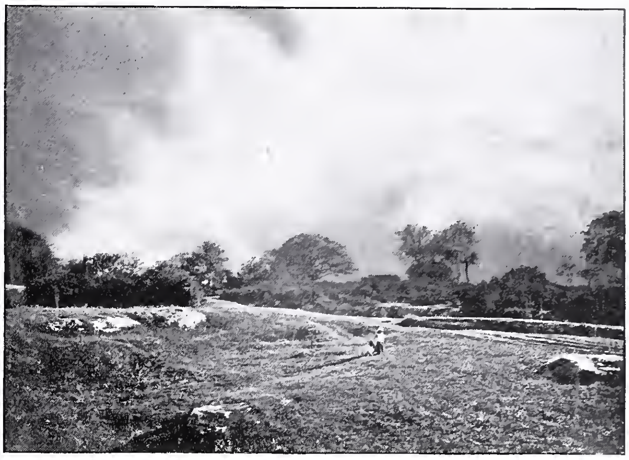


FIGURE 5.

Although there may be only a small portion of sky peeping through a corner it would not be wise to neglect it. Fig. 2 is an example of this. If the sky had been left blank the light and shade and composition would have tumbled to pieces. The same may be said of Fig. 3, where the sky and figures make a picture out of very simple materials.

Fig. 4 is an example in which the sky forms an important part of the composition. Repetition of a light or form, but not of the same strength as the principal, is a useful device in art. In this case the sky was selected because the general effect of the clouds echoed the forms of the sheep. I know that this is sometimes called conventional, or fancy composition, but I also know that it produces a pleasing effect on the ordinary spectator without their knowing exactly how it is done.

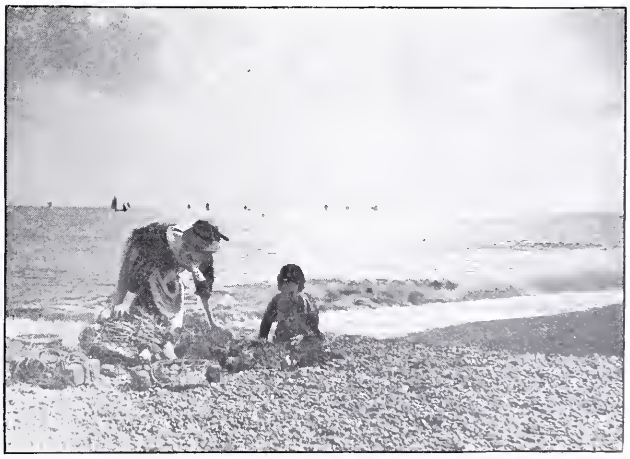


FIGURE 6.

Fig. 5 shows how breadth may be attained by a judicious use of clouds, also how a picture may be made out of scarcely any materials at all. Fig. 6 is an example of an extension of the use of combination printing, which, perhaps, takes it out of the region of the clouds, for it includes the sea on the same plate as the sky, with the figures and foreground on another plate.

In order to show that this attention to the sky is not a new "fad" I select old pictures as illustrations. Figures 1, 3, 4, and 5 were done in 1869 on wet collodion; 2 and 6 on the earliest gelatine plates I ever used.

I should add that if the student cares to make photographing the sky of real interest he will study the nature and forms of the clouds.

The best chart of the sky, showing the forms, heights and names of clouds that I know, is the frontispiece to Mr. Richard Inwards' most entertaining volume on "Weather Lore."

* * *

ATMOSPHERE AND EFFECT.

BY XANTHUS SMITH.

WERE it not that one sees in almost every illustrated journal that they take up (I refer especially to photographic journals), the most flagrant violations of good art principles, it would scarcely seem worth while to add more to the literature of art teaching.

So much is daily written and published about art and its principles and applications, and much of it so lucid and to the point, that one wonders that better application is not made of the teachings so well disseminated. Perhaps, as with many other subjects, it is only by a constant repetition of what is to be conveyed that we can hope to make such an impression as will bring forth proper fruit.

There is no doubt that a good deal of the writing which is published on this side of the water is the work of persons who have read much excellent art teaching, and who have a fair understanding of the subject, but, not being practical workers, are unable to apply their knowledge in a tangible way. And, on the other hand, there are hundreds of practical workers who have not the time to instruct themselves properly, or, if they should have done so, cannot delay the progress of their work to attend to the carrying out of what may, after all, seem like rather trivial matters. A painstaking application of the principles of art in arranging figure compositions or in seeking agreeable effects in landscape, increases a hundredfold the time and trouble involved in producing a good photograph. Many painters, even, are culpable for not spending more time and thought upon their pictures. They find it easier to sit down and copy some indifferent thing which is at hand than to search for the choicest which is to be had.

We have notable examples of what may be attained in photographic art, that is, art of a higher kind in photography, in some of the pictures published the past year in The Photographic Times by English photographers, both in landscape and in figure subjects, and we see by the text accompanying them that the excellence has been attained at the expense of much time and thought in addition to natural artistic talent. There is a truer taste prevailing in art in England than here as yet. It is earnestly to be hoped that in due course of time we also, in America, will foster our own work with a better understanding. That we will, little by little, see good in our own photographic work, purchase the best that is produced, and thereby call forth more and of higher quality,—I refer to genre compositions and landscape art, not commercial work, and so come to build ourselves up as just rivals to European nations in art. Art, like a plant, must be cared for and nourished. The best talent, like seed upon a barren soil, will produce nothing. The leading qualities understood in England in landscape art, in addition to composition, are atmosphere and effect.

Atmosphere, which is a certain amount of haziness pervading the scene when portrayed, produces two important qualities, namely, aerial perspective and mystery.

Representing scenes as painters and photographers do, upon flat surfaces, it should be their constant aim to overcome an appearance of flatness and adhesion of one passage to another, and in no way is this better accomplished than by working during the prevalence of a considerable amount of haziness, thereby attaining an apparent recession of each passage of the view.

When a view can be chosen which furnishes us with a number of receding passages, the eye is sure to be led into the distance, traveling from one passage to another, and giving rise to a pleasing deception by carrying the attention, as it is in nature, from the immediate foreground to the extreme horizon.

Furthermore, atmosphere will be found to be of great advantage in the representation of more confined scenes, and even single groups, because it will furnish us with a comparatively quiet background to that which we would have stand out as pre-eminent in our picture, and, lastly, atmosphere begets mystery and mystery sentiment.

When a scene is presented to us either in nature or in a reproduction of nature, absolutely devoid of atmosphere, the eye takes in the whole at once, and being assailed by a multiplicity of objects and detail is distracted at the same time that it is satified with a full knowledge of every portion, and the mind is deprived of that gratification which is derived in searching for that which is not fully apparent. Many painters, even, are not fully aware of the value of mystery in art. They reveal to us too fully in all portions of their works their intentions. In interiors and in figure subjects, where all is close to the vision, and atmosphere cannot play a part, the object of mystery is attained by obscuring in shadow, in greater or less masses and depth, those portions which should not be revealed too clearly.

One secret of the success of Rembrandt's work is the mystery in the portions of his pictures surrounding the principal incident or story which he wishes to convey. But, one word of caution, we must not run into too much vagueness or slackness in portions of our work. It is quite possible to have a large amount of careful detail, but all so subdued as to require searching for. The photographer is less liable to fall into this error than the painter, the very process by which he works always securing him carefully finished detail. Unless, indeed, he adopt the questionable mode of throwing portions of his picture wholly out of focus,—I say questionable, because it is only under rare conditions that the blurred focus benefits us in our work. I cannot admit that it attains in open landscape what atmosphere accomplishes, or in interiors and groups that it answers the same purpose that well selected backgrounds or well bestowed masses of shadow will accomplish. Mystery, then, attained in sunny out-door scenes by atmosphere or haziness, and in interiors by broad masses of shadow, is a prime quality to be striven after.

Effect and composition are wedded for the photographer. A painter applies them separately, because he may display the best principles of composition in outline pure and simple, but the photographer, whose representations are always in light and shadow, displays his knowledge of composition through his effects. The variations of light and shadow which produce what artists call effect in pictures are wonderful and would seem to be almost infinite. The application of effect is governed by a few broad principles, one of the first being that lights and darks should be grouped or massed together somewhat. In a checker-board we have an example of light and dark disposed within the boundaries of what might be a picture, in equal depth and in equal quantity, but it is not an agreeable thing to look at If we set one up perpendicularly before us and study it carefully for a while, I think it will generally be admitted that a feeling of distraction and fatigue to the senses is the result. But give an artist a sheet of clean paper and some india ink, and ask him to hurriedly produce something effective upon it irrespective of outline and see whether he will not proceed to throw one portion, say a half, at least of the sheet into dark, leaving the remainder light. If he represent a landscape the sky will form his broad mass of light and the earth his dark. Or, if an interior, there will be a source of illumination from which the light will emanate in a concentrated form, gradually spreading and diffusing itself in the apartment, the least lighted portions furnishing the points of deepest shadow. In the landscape, in order that his light may not be a monotonous unbroken mass, he will have some clouds, the shadows of which, together with mountains, trees, or other objects breaking from the earth into the sky, will introduce darks into the light, and by passages of water reflecting the sky, masses of light earth or rocks, he will get his shadow broken up by lights. Now as he makes his interweavings of half light and half shadow, more or less intricate and agreeable, and places his touches of high-light and deep shadow to good or bad advantage, so will he show his knowledge, or his lack of it. Should he be a man eminent for the quality called effect, it will matter little whether he attempt to define his subject or not, he will put upon the paper an arrangement in black and white that will be as agreeable to a person of taste in art as a harmonious air would be to a musician.

The great drawback to the photographer is the difficulty of modifying or re-constructing unpleasant forms and the impossibility of subduing obtrusive lights. Rectilinear and ill-shapen forms violently contrasting each other in light and dark, form the bane of many photographic pictures, and the photographer by being well aware of their existence in a subject which he contemplates reproducing will set about modifying them as far as lies within his power; or should they be too objectionable and uncontrollable he would do well to pass the subject by altogether, for he must bear in mind that, although the rapidity of his means enables him to be prolific, nature is not prolific with her choicest things in art. The production of a really very fine work of art is so rare a thing that it must not be expected, even with the best advantages and greatest pains, that we can produce very many remarkably fine pictures. The progress of the painter's work is a series of enthusiastic efforts and disappointments, and why should the photographer who is striving for the highest art manifestations expect else? We must take our consolation in the knowledge that those things which are the most rare are the most highly prized, and that it is far better to be known as the author of a few choice works than to have produced an abundance not above mediocrity.

* * *

SPINNING.

From *The Photogram.*

BY W. J. ANCKORN.

RUDOLPH EICKEMEYER, JR., AND HIS WORK.

RUDOLPH EICKEMEYER, Jr., had, as a boy, no particular art training beyond the lessons in freehand drawing which form part of every scholar's ordinary course of study, and in which he displayed considerable ability. His artistic bent showed itself, however, in a great love for pictures and the beauties of nature.

His home stood on the edge of extensive wooded lands, and as a boy he was never happier, winter or summer, than when roaming over these wooded hills, through brush and brier, or following the course of the little brook which bubbled over the rocks mid fern and brake. Perhaps nothing more ambitious was his aim at this time than the picking of the first wild-flowers, or the gathering of chestnuts or hickory-nuts; but it is worthy of notice, that when later he became the possessor of a camera, he had only to revisit former haunts to get artistic landscapes, the memory of which had unconsciously impressed themselves on his youthful mind.

Mr. Eickemeyer's father is a practical mechanic, and it has been his aim to give his sons a practical training. Arrived at the proper age, the subject of our sketch was therefore placed in his father's factory, as apprentice, where he served his time like any other youth learning a trade.

This might seem like time lost artistically, but there is no doubt that the thoroughness which he was obliged to exercise stood him in good stead when later in life he took up photography.

Having served his apprenticeship, he was placed on the office staff, and, on attaining his majority, was made a member of the firm. His father, besides being a practical mechanic, is a prolific inventor, and it was of vital importance that he should have a method, both rapid and accurate, of reproducing the machines he invented. To send for a photographer every time one was needed, was a great deal of trouble, and the result achieved was not always the desired one, and it soon became apparent that some one connected with the establishment must be trained to do this work. As young Mr. Eickemeyer had a natural aptitude for seeing the most striking characteristics of the machines to be photographed, it was but natural that he should be detailed to this task.

For this class of work any camera was considered good enough, so a small 5 x 8 instrument was procured, and he set to work.

He was not satisfied long, however, to limit his photographing to the reproduction of machinery; his ambition urged him on.

Winter was almost at hand, the trees were leafless. Choosing a scene of his earlier rambles, he took his first out-of-door picture, which any artist would say, shows strong artistic feeling.

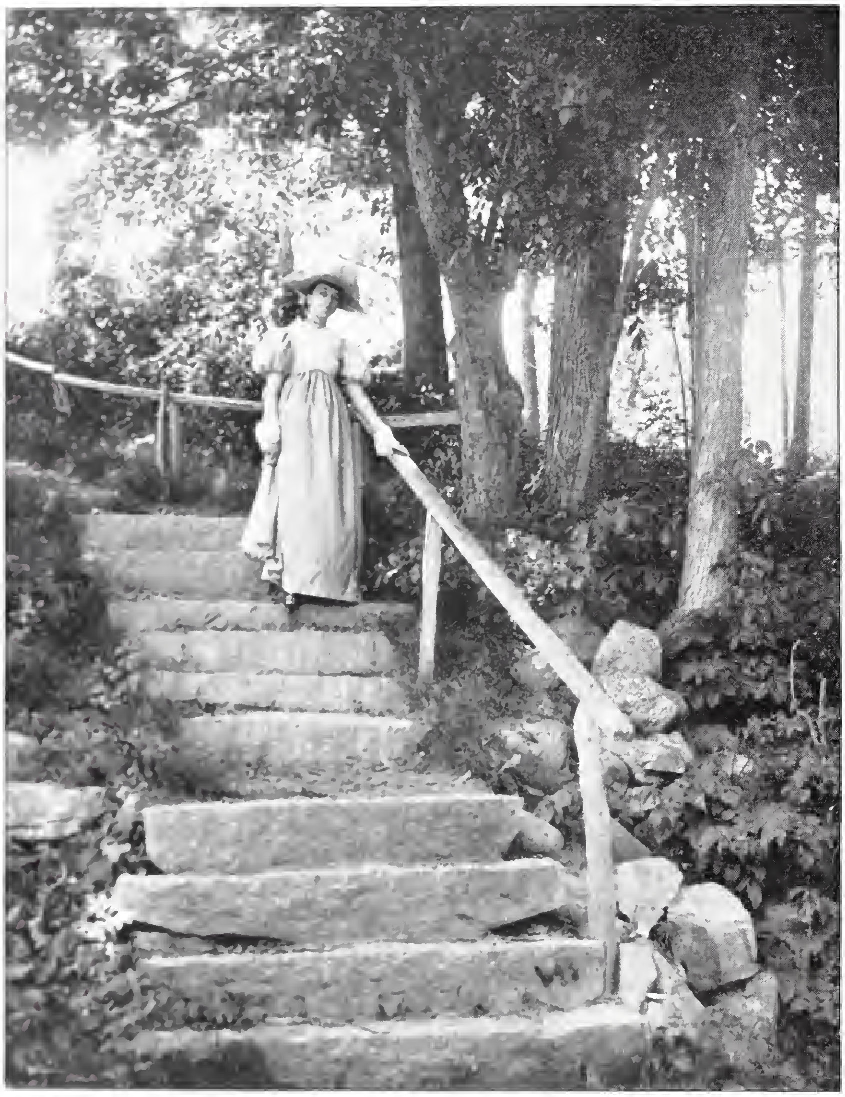
A daring marks this early period of his work. He went, for instance, during the following summer to Niagara, and with his 5 x 8 camera he took a series of pictures of the falls, for which, on his return, he received an offer from a professional photographer, who wished to publish them.

RUDOLPH EICKEMEYER, JR.

His portraits taken in-doors, under circumstances both baffling and unfavorable, were often beautiful and artistic. One of these early attempts at portraiture taken in a country house, before an ordinary window, the light reflected from a white sheet and the snow on the lawn under the window, was illustrated in The Photographic Times Christmas Number for 1890.

The artistic abandon in the attitude of a youthful nephew, after dinner, suggested the little picture, to be found at the end of this article, for which Longfellow's words are chosen: "Are these celestial manners, these the ways that win, the arts that please?"

This, too, is a specimen of his early figure work, and, like the above picture, received the first prize at one of the exhibitions of the Yonkers Photographic Club.



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AS SHE COMES DOWN THE STAIRS.

In time Mr. Eickemeyer, feeling the limitations of so small a camera, bought a larger one.

"Never," he says, "shall I forget my impressions on looking for the first time at a landscape on the ground-glass of this larger camera. It was a breath of free air after being in prison."

His work, from this time, unconsciously broadened, and seeing the result in his own case, he has become a firm advocate of large work, believing that small cameras tend to cramp ideas and [illegible] results.

The need of a studio where he might take some figure studies now made itself felt, and he cast about for a place. The only one available was the attic of a barn, which had long been given up to pigeons and sparrows.

In an article in THE PHOTOGRAPHIC TIMES of March, 1890, Mr. Eickemeyer writes of this studio. "It was luxurious in point of room only, with a large north window reaching nearly to the floor and two small windows on the south."

In this rude studio, with the aid of borrowed accessories, he took many beautiful pictures; "Mistress Dorothy," which received a silver medal at the Philadelphia Exhibition last year, was taken in this room.

At about this time Mr. Eickemeyer and other amateur photographers desiring the impulse of each other's criticism, organized the "Yonkers Photographic Club," on the Executive Board of which he served actively for a long time.

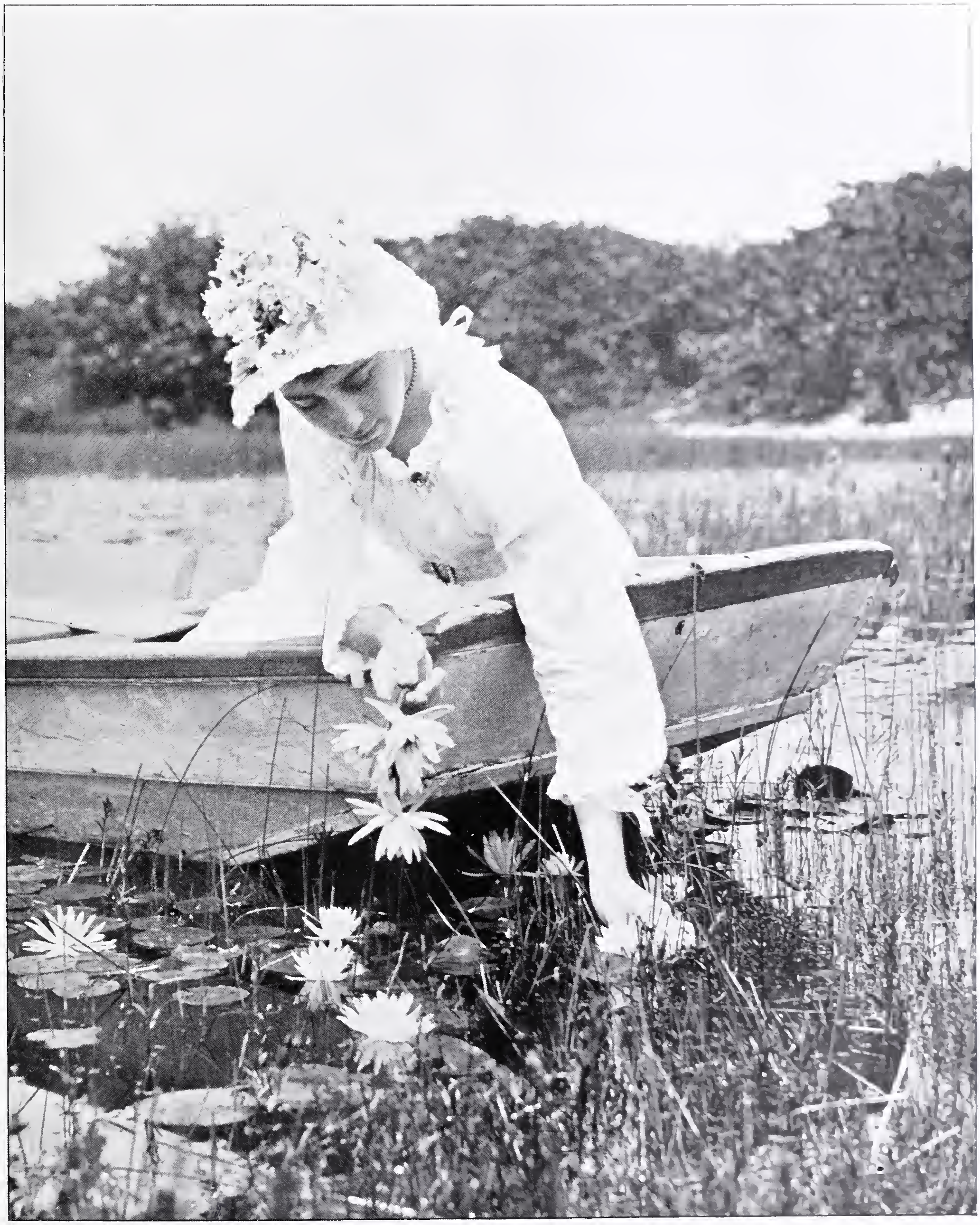
So long as this society existed, he never exhibited his pictures anywhere else.

It was the demand for his work from outside sources that led to its reproduction in photographic journals.

As a member of the firm, he found himself possessed of more leisure, and he made several trips of which his photographic records are complete. Large portfolios of views from Europe, the Rocky Mountains, California, Berkshire Hills, the Catskills, Long Island, and five volumes of figure studies, testify to his industry; and the average beauty of the photographs prove that his success is due to the possession of artistic feeling and not to chance.

In the spring of 1893 he exhibited six photographs at Philadelphia and received a silver medal for the "Lily Gatherer" and "Mistress Dorothy."

From a large number of pictures which arrived too late for exhibition at the Photographic Salon in London in 1893, Mr. Eickemeyer's were the only ones mentioned in an



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THE LILY GATHERER
BY RUDOLPH EICKEMEYER, JR.

article by Mr. Davison, and he criticized them in a way most encouraging.

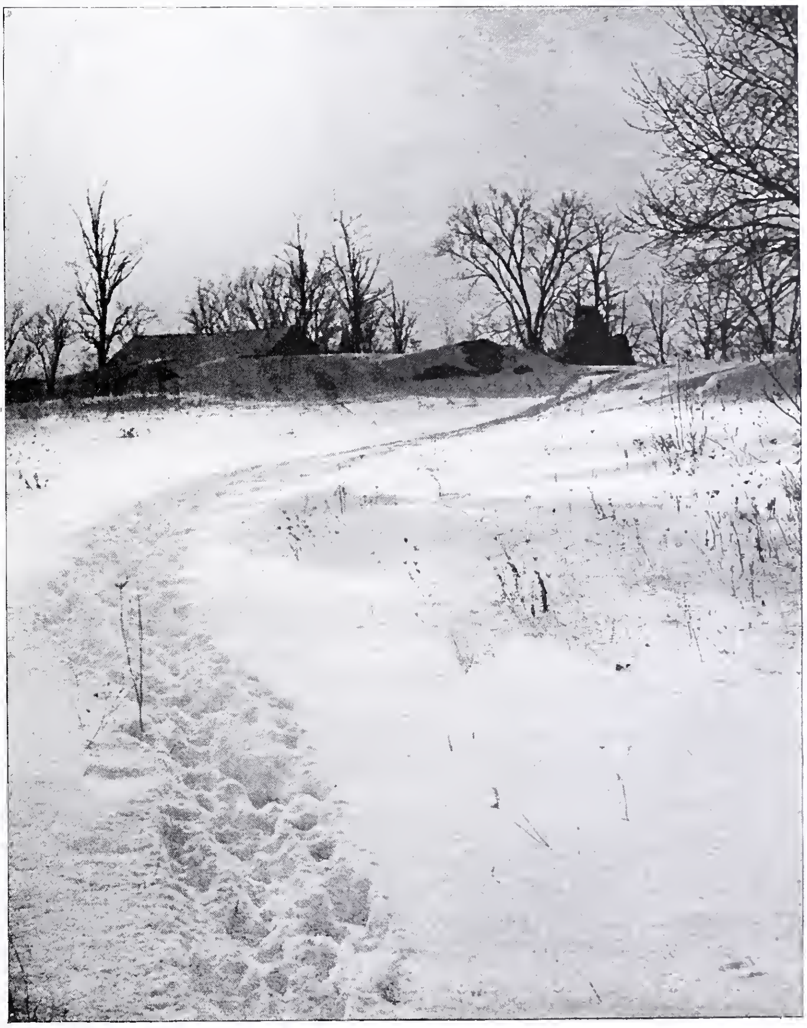
His greatest triumph, during 1893, was achieved at the Hamburg International Exhibition of Photographs, where over six thousand pictures were shown from all parts of the world.

There his eleven pictures received the highest award, a gold medal presented by the State, and in addition he was awarded an "honor" prize.

Prof. Dr. Lichtwark, Director of the Art Gallery at Hamburg, in a lecture on "The Nations and their Representatives at the Hamburg Exhibition," says:

"Each artist has chosen a particular field for his own, which he cultivates in preference to any other. What he photographs in another field, is done rather to relieve the monotony than for any other reason.

"Mr. Eickemeyer's specialty is the successful photographing of beautiful women. He does not dress them up as Gretchen, Princess Lamballe, Theodora, or any other lady who serves as a type for an historical costume, but he presents them in light draperies, unspoiled by fashionable cutting or fitting. And he strives to bring them into harmonious surroundings; they descend the stairs under the trees of a park; they reach out from a boat to pick water-lilies; they push a boat from the shore or they nestle in the corner of a settee.



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SWEET HOME.

And in further praise of his originality, he says:

"Eickemeyer's pictures do not remind me of any ideals in high art as the work of some other exhibitors recall the motives of well known artists."

At the Paris Salon, six of his seven pictures were accepted, and one of them was reproduced in a magnificent volume of reproductions of the principal pictures, published by the Photographic Club of Paris.

At the New York exhibition held last spring, at the gallery of the American Fine Arts Society, under agreement between the New York, Boston, and Philadelphia societies, his picture, "Sweet Home," was awarded the President's Gold Medal, given for the best picture, entirely the work of any member of the Society of Amateur Photographers of New York. Of this picture, *Photography* says: "'Sweet Home' is a bold venture. The picture is nearly all foreground, and the house in the distance is nearly at the top of the print. Yet the light is so subdued upon the snow, there is such an absence of that painful prominence so often given to a foreground, and the result is so effective, that we overlook the non-obsrvance of a canon as to foreground. It is very delicate and choice, and presents a picture that few painters could ever hope to express."

At the Newcastle-on-Tyne International Photographic Exhibition, held April 13, 1894, Mr. Eickemeyer received three silver medals, all first prizes in three open classes.

The Newcastle *Daily Chronicle*, in an account of the exhibition, says: "The most important section, of course, is that open to all, and it includes the very cream of the exhibition.

"The landscapes are exquisitely soft and beautiful. The judges have given the silver medal to 'Sweet Home,' by R. Eickemeyer, Jr., a delightful, pure and clear winter scene, with a stretch of virgin snow and a darker bit of rising ground at the end of it. The delicate lights and shades are reproduced with wonderful fidelity.

"The class of portraits is a large one and full of interest for everybody. Many of the best known photographers, local and national, are among the exhibitors.

Copyright 1893. By R. Eickemeyer, Jr.

A FLOWER.

"Mr. Eickemeyer is again at the head, receiving a silver medal for a study which he calls 'My Father.' It is a noble head, after the Rembrandt style, and has the mellow tint of an old etching.

"Genre and figure studies introduce a still more interesting and artistic set of photographs, and here again Mr. Eickemeyer is successful, receiving the silver medal for 'A Flower,' an extremely pretty girl figure."

At the recent International Exhibition in Arnheim, Holland, Mr. Eickemeyer was once more successful, and took the first of three gold medals in the only class open to foreign competitors, both professional and amateur.

Mr. Eickemeyer's latest recognition from abroad has come from the exhibitions held in England last fall.

Copyright 1893. By R. Eickemeyer, Jr.

THE WINDOW GARDEN.

His greatest triumph was achieved at the Exhibition of the Royal Photographic Society of Great Britain, where five of his pictures were accepted; his "Sweet Home" receiving the much coveted medal of that Society. An honor which, we believe, has come to this

Copyright 1893. By R. Eickemeyer, Jr.

"HE COMETH NOT," SHE SAID.

country but once before. All the English photographic journals concurred in the opinion of the judges concerning "Sweet Home," and, without exception, praised it in the highest terms.

One of the ablest critics and photographers on this side declared it to be one of the best, if not the best picture of the year.

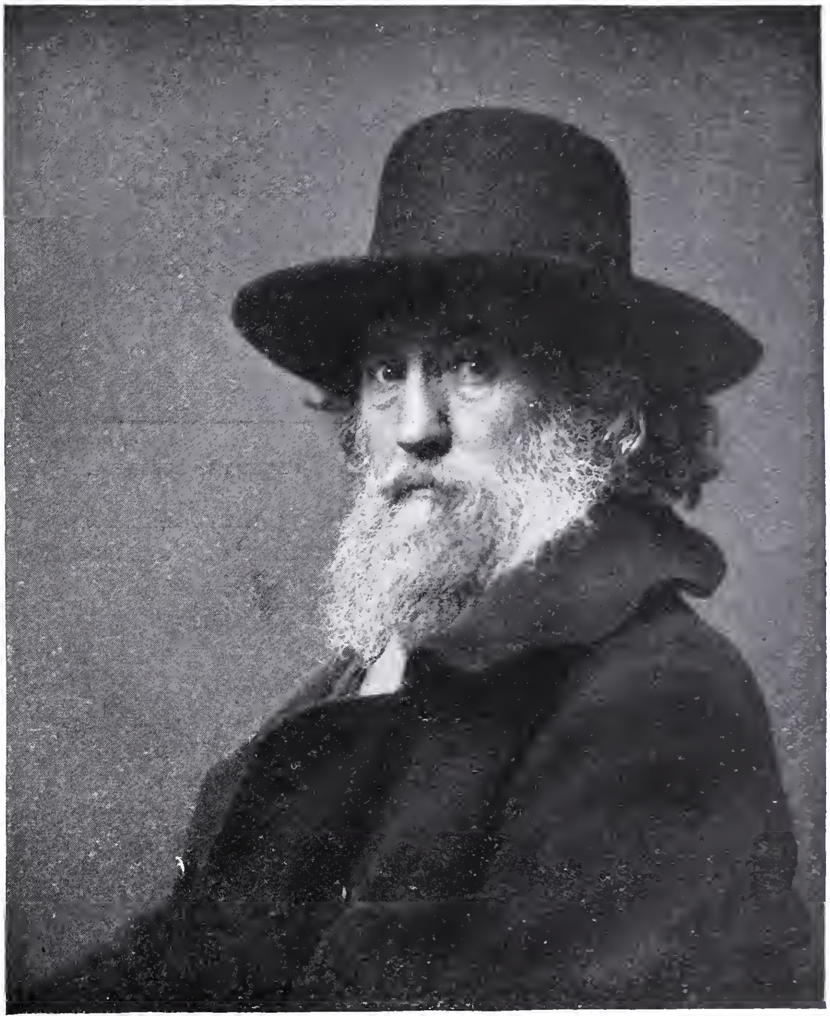
After the Royal Photographic Society Exhibition his pictures were shown at the exhibitions at East London, Hackney, Ealing, Stanley Show, and Leytonstone.

At these various exhibitions where his pictures came into competition with the medalled work of the best English, Continental, and American photographers, the following pictures were medalled: "He Cometh Not, She Said," "The Kitten's Breakfast," "Portrait of my Father," "A Summer Idyl," receiving one medal each, and "Sweet Home," and "As She Comes Down the Stairs," two each; eight medals—four first, three second, and one third.

At the Photographic Exhibition held in connection with the Twenty-third Regiment, the frontispiece of the present number, "Hickory, Dickery, Dock," was awarded a silver medal.

During the year 1894 his pictures were shown at ten International Exhibitions, receiving sixteen medals, all but four being first prizes. The total number of his awards is thirty-seven.

Mr. Eickemeyer is a member of the Society of Amateur Photographers of New York, Honorary Member of the Columbia College Photographical Society, and Corresponding Member of the Amateur Photographic Society of Hamburg. He was born at Yonkers in 1862, and is, therefore, but 33 years of age. A study of the pictures which we reproduce here cannot but convince one that the subject of our sketch is a man possessed of deep artistic instincts, a man able to see with the artist's eye. Take, for instance, his picture, "Sweet Home," undoubtedly his best piece of work. There is little doubt but that hundreds of photographers would have passed such a scene by as being too trivial or too commonplace to be worth the expense of a plate, or the trouble and labor required for an exposure. But the eye of the artist saw in it the possibilities of a picture, capable of improvement. This he proceeded to do by breaking up the monotonous foreground and inserting a long, bent, foot-trodden snow path. What success the picture has met with, we have already chronicled. It is undoubtedly a beautiful study and worthy of the highest praise. The reproduction only gives but a faint idea of the softness and delicacy of the original bromide print.

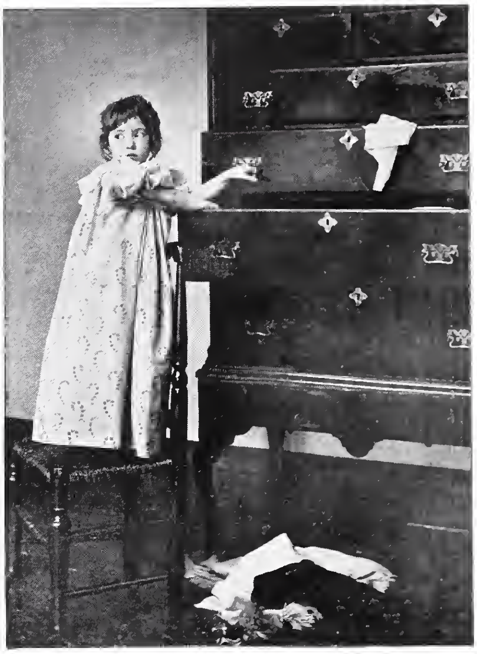


PORTRAIT OF MY FATHER. By R. Eickemeyer, Jr.

The Royal Photographic Society have expressed their desire to add this picture to the collection of representative photographs which they are getting together.

"I believe," says Eickemeyer, "that photography has its limitations, and that more picturesque results can be attained by the successful interpretation of simple subjects near at hand than in photographing of mountain ranges, huge cataracts, or other stupendous phenomena of nature."

Herein lies the secret of his success. He attempts only what he can perform. H. P. Robinson, in his admirable work, "Picture-Making in the Studio," says: "If you will consider over all those photographs that have pleased you most from an art point of view, you will find—and if you have not thought over the subject before it will surprise you—that the best pictures, those you have considered the greatest triumphs of our art, have been of the simplest description. An unsuitable subject may surprise by its daring, excite wonder by its mere size, and admiration by its display of art-power; but these emotions are of the moment only; they do not last—and then comes the feeling of insincerity, and the whole wonderful castle in the air dissolves; it has no substantial basis. Your admiration may have been captured by the display of skill, and your sympathies won by the evident earnest effort, but you soon feel the fraud."


By R. Eickemeyer, Jr.

CAUGHT IN MISCHIEF.

Eickemeyer does not choose any complex theme altogether unsuited to the art of photography, but rather some simple subject, selected with the determination to execute it perfectly, and by untiring perseverance he succeeds. Many there are, perhaps, who imagine that much of this success is the result of good luck. In our next issue we shall give a complete account of how one of his pictures was made, which we think will convince anyone that such is not the case.

In all his pictures there is thought, feeling and an originality which is never out of harmony or eccentric.

All this is very gratifying and should at least be encouraging to others with no particular art training, for it proves that, given artistic feeling, there is no reason why care and thoroughness should not surmount all difficulties, and crown one's efforts with success.

Eickemeyer has before him a brilliant future, provided he steers clear from the rocks which lie in every man's path who pursues this journey. He has but to be careful not to become blinded by his successes, or conceited by the praises bestowed upon him.

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Photograph by R. Eickemeyer, Jr.

"ARE THESE CELESTIAL MANNERS?"

"HYPO"—AND HOW IT IS ABUSED.

BY LT.-COL. JOHN H. JANEWAY, M.D.

SOMETIME since there was sent me to test a sample of thiosulphite of soda, made by a new process.* It was brilliant in appearance, the crystals small, but perfect in structure—monoclinic—and by the usual tests it was found to be chemically pure. It dissolved rapidly in cold water, even to saturation, and filtration after solution was superfluous. Here was a great boon presented to the photographer, and this thought flashed out; the skilled artisan seeks for the most perfect tools possible to be obtained, in order to produce his most perfect work, and have we not been working with a very imperfect and impure article, without seeking to improve it, all these years. May not many, if not all the objurations constantly, and justly too, heard against this very necessary chemical, arisen from the fact that it was a decidedly impure one, made so by the producer, or by our own ignorance of the requirements of the plate, and a want of due reflection in its use, and until we can have a better substitute, it certainly is important for us to use the purest that can be obtained.

It will be necessary to give a short chemical description of this salt. Though it should be familiar to all, I fear very much it is to the majority probably unknown, except by name, that we may recount how our poor old friend and also enemy, "hypo," is constantly abused.

"Hypo" is the sodium salt of thiosulphuric acid—not hyposulphite as thought by many—and is called by chemists sodium thiosulphate. Photographers use the older name sodium hyposulphite, or hyposulphite of soda. Thiosulphuric acid is connected very closely to sulphurous acid on the one hand, and to sulphuric acid on the other, and in consequence hypo and the other thiosulphates are nearly related to the sulphites and sulphates. Oxygen or an oxidizing agent when brought into contact with sulphurous acid or a sulphite, causes a more or less rapid combination to take place, and the sulphurous acid is converted into sulphuric acid, and the sulphite into a sulphate. Likewise, when under certain circumstances sulphur or a sulphureting agent comes into contact with a sulphite or sulphurous acid, they combine, forming a thiosulphate or thiosulphuric acid.

A sulphite contains one (1) atom of sulphur and three (3) atoms of oxygen. A sulphate contains one (1) atom of sulphur and four (4) atoms of oxygen, and is therefore an oxidized sulphite.

The corresponding thiosulphate contains two (2) atoms of sulphur and three (3) atoms of oxygen, and is a sulphureted sulphite. These differences in combination necessarily produce differences in the properties of both the acids and the salts. The sulphates have but little tendency to decompose, but the thiosulphates, with the exception of hypo and a few other thiosulphates, are extremely difficult to obtain in a pure state, and are greatly prone to decompose even at ordinary temperature.

"Hypo" pure, and in the solid state, is reasonably stable, when kept dry and covered. Should the crystals become dull, opaque and effloresced or liquified, you may know that the salt is impure and, in proportion to the rapidity of these changes, so is the ratio of the sophistication. If any one desires to ascertain with exactitude whether any sample is pure, it can easily be done by a solution of pure dry iodine. 24.8 grains of clear dry hypo ought to be entirely decomposed by 12.7 grains of iodine. Any defect in the quantity of the latter required to effect complete discolorization of its solution indicates the proportion of impurity present.

Thiosulphuric acid combined with sodium "hypo" in solution is extremely unstable. The addition of a small quantity of any acid—sulphurous acid only excepted—to a solution of hypo at once sets up a chemical decomposition—the liquid very soon becomes opalescent, which gradually increases—sulphur is precipitated gradually, and the solution acquires the well-known smell of sulphurous acid. The sodium thiosulphate is partially decomposed and the thiosulphuric acid is set free, and which at once begins to split up into sulphurous acid, which remains in solution and sulphur, the sulphur being precipitated. The stronger the solution and the higher the temperature the greater the amount of the decomposition. Whether this action ceases in a short time, or is prolonged for some months is still a mooted point. When it finally does cease the solution contains precipitated sulphur, sulphurous acid, thiosulphuric acid, products of secondary combinations, together with unaltered hypo, or an acidifying acid, or both. It is frequently stated that thiosulphuric acid cannot exist in a free state, but the experiments of Colfax seem to confirm the opinion of the older chemists that it does.

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* Walpole's New Process Hypo.

Considering the above reactions it seems surprising that so many writers and others should so strongly urge an acidified bath for fixing the negative. A careful review of the above shows that ordinary acids cannot be used for acidifying the bath without decomposing a part of it. That sulphurous acid differs from the other acids in its action on hypo is admitted, and is most generally advised in the preparation of the acid bath, or, to accomplish practically the same thing, a sulphite or acid sulphite is recommended. But the final product in either of these cases, is a solution of hypo or sodium thiosulphate containing also sulphurous acid with or without an acid sulphite. We have been asked the question, does sulphurous acid act in any way upon the hypo and interfere with its fixing (clearing) powers? Sulphurous acid does act slowly upon hypo, at the ordinary temperature, producing in all probability what is known as sodium trithonate, but as yet there is no chemical evidence of any tendency to cause decomposition of the silver salts, but we know there is produced a gradual reduction in the strength of the bath. It also gradually combines with the oxygen of the air and is converted into sulphuric acid, and the latter is very prone to bring about some decomposition of the hypo. Hence the acid bath should be kept tightly covered, if it is desirable to use one.

Having thus shown the actions of acids upon hypo in solution, and especially of sulphurous acid, let us now consider the effects produced in the bath by the addition of alum, the salts of iron, lead and silver, etc. As their employment is necessarily of much importance to the photographer—especially so, as so many of them are advised as additions to the fixing bath, either without due consideration of the chemical reactions that must necessarily, and do, take place, or for some disingenuous reasons. Alum—the ordinary or the iron—(chrome alum) are the most frequently used—are salts of decidedly well marked acid reaction, and behave very much in the same manner as a free acid. A double decomposition takes place upon the mixing of these salts. Thiosulphite of aluminia is formed which immediately begins to break up. When the two solutions of hypo and alum are mixed, the liquid at first remains clear, but quickly becomes cloudy, and soon a well-marked white, or yellowish white, precipitate is formed and continues to form for some time. This precipitate is a mixture of hydrated aluminia and sulphur, and when chrome alum is used, also iron. When finally settled and the liquid has become quite clear, it gives off a strong smell of sulphurous acid, and contains either no hypo or no alum. The change takes place rapidly at first if each of the solutions are strong, but gradually decreases, and finally ends. At what period of time that this cessation occurs, is still a mooted period. One authority states that it continues at ordinary temperature for at least three months, and that when it does cease, one or the other of the salts is completely decomposed; and that an equivalent quantity of the other salt is decomposed at the same time. The hypo is converted into sulphur, which is precipitated, sodium sulphite and sulphurous acid remaining in solution. The alum splits up into hydrated aluminium, which is precipitated, and sodium and potassium sulphates remain in the liquid. If we remember that, as mentioned above, the whole of one of the salts is entirely used up in the chemical reaction that has taken place, and a large part of the other, we may well ask the questions, what is the use of mixing them together? or of what earthly value is an acid fixing bath compounded with alum or hypo, when we know that the hypo is entirely or partly decomposed, and that after a little while practically there is no alum left in the solution?

The claim that the fixing bath, to which alum has been added, does exert a certain stain-removing and hardening effect that is not obtained by the ordinary fixing bath, and that these actions are due to the alum alone, seems to me to be fallacious, for it has been shown that changes have taken place in the bath so compounded that precipitates have been formed and practically there is no alum in the bath. Then we must recollect that sulphurous acid has been formed and is present in the bath; and that there can be but little doubt that removal of stains and hardening of the film is due to the presence of that acid. These effects have been produced by dilute sulphurous acid, and are also produced by acid baths made by adding sulphurous acid or acid sulphites to the ordinary hypo solution. 'Tis better to use a pure article of hypo in fresh solution and afterward, if necessary to harden the film, a few grains of chloride of aluminium or formalin, in solution, to obtain the best results.

In regard to the addition of the salts of lead, silver and other metallic compounds to the hypo bath, we must say that they produce decomposition, but somewhat different from that of the acids and give rise to complicated changes and complex results. New compounds are formed, such as the thiosulphate of lead, silver, etc., and, like most of the thiosulphates of the heavier metals, are very prone to spontaneous decomposition; and again a number of these have the ability to combine with the hypo and form double salts of much greater stability.

It has been stated that the addition of borax to the nitrate of lead will prevent its decomposition in the hypo bath. This statement is incorrect except perhaps when chemically pure hypo is used.

After what has been said of the combined fixing bath, the certain chemical reactions that will take place, the unavoidable splitting up and decompositions occurring from the additions of chemicals that are constantly recommended, and the injurious effects that are liable to be produced upon the film and danger to the life of the negative, what shall we say of the combined fixing and toning baths so freely recommended and earnestly advocated at the present time? Many of these recall the great crops of developing formulas scattered broadcast only a few years ago—when the strife seemed to be—who could put in the greatest number of chemicals, regardless of their composition into the developer, and feel well satisfied with their mixture, if a little doubtful of its composition, still inspired with the hope that at least one substance would be just the thing needed.

Medically speaking—shotgun prescriptions. Photographically a chemical slush—and no objections that can be raised against this slush are strong enough to express its proper condemnation. It is useless to mention the various ingredients recommended. But a very slight knowledge of chemistry should be enough to convince the authors of the utter uselessness and danger of their compounds. The action of the combined toning and fixing bath is first to fix the print and then to tone; and one of the advantages claimed for the bath by its adherents is that it will give the tone wanted, and that the tone cannot be altered by any subsequent fixing. If this is the strongest argument that can be urged in its favor, by far the simplest and most rational method would be to fix the print first, wash and then tone in a separate bath of sulphocyanide made distinctly alkaline with potassium hydrate. This also may have its objections, but it is more rational. The claim that lead which enters into the composition of many of these baths keeps the whites pure is fallacious, for many experiments very carefully made with and without lead have failed to confirm this assertion. It is not so many years ago when lead was recommended as a hypo eliminator.

The claim that the combined bath does away with one operation or combines two in one, is most assuredly the plea of a very lazy man. But if you must have a combined toning and fixing bath (and I can imagine that circumstances might arise when it would be convenient to have one) use the simplest and least objectionable one that I know of—that recommended by Professor Burton, consisting only of hypo and chloride of gold, and no previous washing is required either.

Finally, remember that acids and metallic salts, alum, iron, lead, silver, etc., all decompose hypo, even the purest when combined with it in solution, and therefore any bath that contains these is prejudicial to the long life of both plate and print, and that probably, from what has been stated above, you will agree with me, that hypo has been, and still is, the best abused photographic chemical we have.

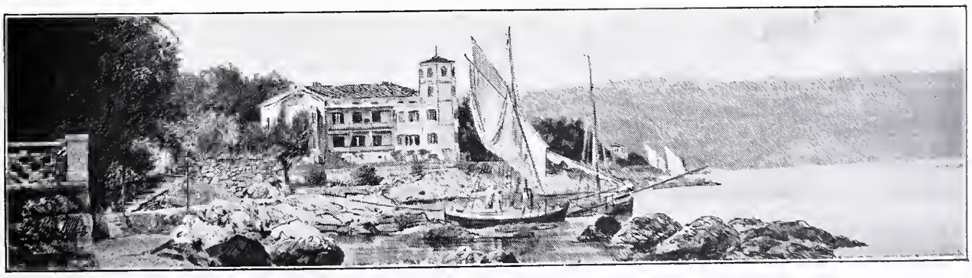
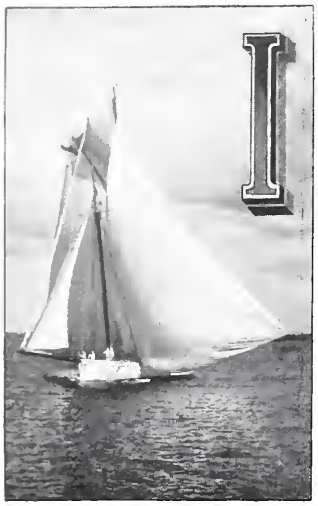


PLATE VALUES.

BY S. HEMINGWAY, M.D.



IN my article in the "American Annual of Photography and Photographic Times Almanac" for 1894, namely, "A Plea to Amateurs for Time Exposure," etc., there are several errors in regard to the plate value. On account of many causes this correction has not previously been made. The writer desires to fully demonstrate that his idea with regard to the plate value is true. It is evident that there is error in the tabulation of plate values.* It may have been the fault of the writer or of the printer, but, in any event, the tabulation of the valuation of plates has been such that it practically ruins the value of the article. Each plate has its actual value, no more or no less. It is absurd that a man should use the most sensitive plate on seascape and at the same time would use the same plate for woodscape. It is necessary that in the selection of plates in photography, that one should use only such plates as are adapted to the particular work in hand. Now, for instance, are you going to take a seascape with brilliant sky and brilliant water, and at the next minute are you going to take a dark, shadow-covered woodland with the same plate value and exposure? Can you expect the same effect, the same density, depth and detail that you would expect from a free landscape with the same exposure? No; there is no possibility of getting the impression on a plate unless you give it sufficient exposure. Common sense tells you that the deeper you press anything upon any surface the deeper is its impression. Therefore, by exposing your plate for a time exposure, the deeper is its impression upon the plate depending upon the duration of the time of the exposure. To be a snap-shot photographer is to be one that possibly accomplishes something, but, in reality, fails to give us the true value of photography. It is possible that any one can "press the button" and take the picture, but at this moment the photographer ceases to exist, and by others the picture is developed. So, then, having blindly "pressed the button," the picture is sent to the developer, and he, after developing, returns it to the taker, with prints. Is this photography? It certainly helps "the photographic fever," but does it really develop photography? Positively no. In the mistakes that were made in the article in the "Annual" of 1894, there was no intention whatever to reflect on any manufacturer of plates. A very distinguished authority upholds the fact that it *is* possible to have too rapid a plate.* Manufacturers should not seek for the mere fact of having too rapid a plate, because by doing so they manufacture a plate which cannot in any way produce the results they wish, except in its special use. With the claim of the most rapid plate that can be made, would the manufacturer declare that they should be used for seascape or sky views? No; he himself knows that the seascape, as compared with the landscape, different plates should be used. Supposing, for instance, which, by the way, I believe to be true in many instances, that a person uses one plate alone of a certain plate value, and uses it for seascape, cloud effects, portraiture and cellar views, how is it possible that one can get the same effect in three or four different conditions with the same exposure? It is impossible. Would any one pretend to take an individual in a very strong light and on the same value plate, and with the same exposure attempt to take the same individual in the darker shadow? It must, at the same time, be acknowledged as demonstrated by Prof. Ch. Ehrmann, that altitude is a powerful factor in increasing the rapidity of exposure.

There is too much tendency on the part of the amateur to use one plate indiscriminately for all views. In the article already referred to, all the factors in photography are briefly considered.

As this article has only to deal with plate values, slight reference will be made to the other factors, in order to stimulate *time* rather than *instantaneous* exposure. There are two classes of amateurs; the one thoroughly learned in photography, who by their excellent work stand above the standpoint of amateurs. To these I am not speaking. I am seeking to put more photographic light to those who are earnestly seeking to perfect themselves, but who, by lack of association, do not get the attrition with experienced photographers. All photographers will acknowledge that with a B plate for sky and sea, better results can be obtained than by a "Stanley Quickest" or a "Carbutt Eclipse."

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* A comparison with the "Annual" of 1894 will show the gross errors of tabulation of plate value.

* Dr. J. H. Janeway—"Index Rerum Photographic," *American Amateur Photographer*, March, 1894.

As already stated, each plate has its value for its especial use. It is impossible to get a plate for general use covering all subjects, regardless of light and shade. The effort of the manufacturer to provide a very rapid plate is commendable, but can any plate manufacturer say that any plate, rapid, medium, orthochromatic, non-halation or slow, will answer every requisite? No; each plate has its use, and the amateur should carry in his kit, with holders, different plates of different values.

A friend of mine with a kit of films took indifferently the hold of a vessel, a sunrise, a group on deck in bright sunlight, a sleeping sailorman behind the bulwarks in deep shadow, and a man aloft, the camera without swing back, and you who understand it can imagine the result. Plates have values, and amateurs should know it. Instead, then, of getting three good pictures out of forty, in proper consideration of the factors, you will get forty good pictures out of fifty. But understand, you must know the capabilities of your camera, and do not attempt the impossible. As stated in my article in the "Annual" of 1894, the only excuses for snap pictures are:

1. Objects in rapid motion.
2. Objects expected to suddenly take motion.
3. To catch expressions of face.
4. To catch attitudes existing only momentarily.

Anybody can "press the button," but *you must* "do the rest." Therein comes the beauty of photography. You have pointed at something, and until it comes back to you, you do not know the rest. A baby can "press the button," it is brains that do the rest. While I have championed rodinal and paramidophenol, I advise you to use pyro-soda or pyro-potash. The formulas can be found in the "Annual." Having carefully studied this, the original developer, you can after take up whatever developer suits you, but stick to it. Having gone through the intricacies of many developers, you will find one to your suiting, and then stick to it and learn its vagaries. So then, remember that one plate will not answer all subjects. I now append my tabulation of plate values and the other factors in making photographic pictures, and, at the same time, advise time exposure in the most positive language, when practicable.

The following factors must be considered in connection with the plate values, and for a further consideration of them, the reader is referred to the "Annual" of last year.

FACTORS.

1. Light, condition of.
2. Rapidity of plate.
3. Subject.
4. Diameter of diaphragm.
5. Time of day.
6. Distance.
7. Altitude.
8. Rapidity of shutter in instantaneous work.

PLATE VALUES.

Carbutt B equals 1—Standard of value.

Carbutt Eclipse equals 14 times quicker than Carbutt B.

Cramer Banner equals 4 times quicker than Carbutt B.

Cramer (60) Crown equals 14 times quicker than Carbutt B.

Stanley quickest equals 16 times quicker than Carbutt B.

Seed 23 equals 6 times quicker than Carbutt B.

Seed 26 equals 12–14 times quicker than Carbutt B.

Harvard equals 12 times quicker than Carbutt B.

New Eagle equals 14 times quicker than Carbutt B.

There is no intention to reflect upon the Carbutt plates, or any other manufacturer, for I have always found them all entirely to be depended upon, and are always true. I have made no reference to the films of any maker, as I do not use them. This article is simply the result of careful experiments, using from two to three cameras at an instant in "snap" pictures and two with time exposure both at the same moment and same time. The main developer has been a double solution of para-alkaline, and has been used both in winter and summer, and other plates have been treated with pyro potash; rodinal. From the former I have had excellent results. Without the apparent density of the pyro development, I have had with the para-alkaline less but sufficient density, and better detail.

Let me add that in a deep wood interior, your most rapid plate will require time exposure, and, on the other hand, your B plate will be an instantaneous plate on light cloud effects or waterscapes; and in taking a time exposure of landscape do not think your plate is spoiled if, in a six or eight seconds of time exposure, a horse and wagon or an individual walks, not too slowly, across the field you have in view, as there will be *no* impression of these elements upon the plate.

It would appear at first thought that by placing the Carbutt "B" plate at so low a rating it was a disparagement, but I have tabulated it as it is, for the reason that this plate will give a greater latitude of exposure than any I have used; and the same can be said of the Orthochromatic and Columbian—and last one, especially in interior views. In view of the foregoing statement, the following extract from Octave Thanet's "Adventures in Photography" is corroboration: "For brilliancy we have found the Carbutt plate unequaled; for a beginner, I should unqualifiedly praise the Carbutt 'B.' It gives more leeway for the photographer to make a fool of himself than any other plate on the market; he can hit the right exposure more nearly on that long-suffering plate than on any slow plate that I know of, simply because two or three seconds seem to make little difference to its patience."

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SHADES OF EVE. BY HER GRACE THE DUCHESS OF SERMONETA.

IMPORTANT TRIFLES.

BY HECTOR MACLEAN, F. G. S.

HAVING for the past five years filled the position of President of the Croydon Camera Club, during which period I have been rarely absent from any of the weekly meetings held in the autumn, winter and spring months, I have in the course of my pleasant duties been on a good many occasions made aware, *at first hand*, of quite a large number of more or less unsuspected causes of photographic failure which have from time to time befallen various members of the aforesaid photographic association. A few words respecting the tolerably important trifles thus brought under my observation will, I trust, be useful to a proportion of the readers of THE TIMES.

Bearing in mind that I am writing for those who are unacquainted with the status of the various English local photographic societies, let me explain that the Croydon Camera Club, founded in 1890, has its headquarters in a town numbering some 120,000 souls, and since the Club was organized about 200 photographers of all kinds and calibres have been elected as members. Its meetings are very real in the sense that mere twaddlesome word-spinning is greatly discouraged, while free expression is invited, and usually forthcoming, upon those exasperating posers which are everlastingly arising, to puzzle the will and balk the efforts of even the most experienced among cameraists.

Looking back upon the varied assortment of stumbling blocks which have been brought under my official notice, I almost marvel that —as far as amateurs are concerned—any even passable photographs are obtainable. And I feel sure that there cannot be a single photographer—be he never so careful and precise—who has not at one time or another been greatly annoyed and much mystified by apparently unaccountable failure waiting upon his efforts. Although in the following notes many will no doubt recognize the reasons of disasters which they have experienced, I do not pretend that my list is even approximately complete, nor particularly novel.

In the first place, our knowledge of photography is at present entirely incomplete. Secondly, I am confining myself solely to that which has come directly under my notice Anyhow, the following is enough for one meal.

Perhaps nothing more fruitful in causing spoiled plates has been elucidated than that unpardonable nuisance—"faulty construction." I call it unpardonable, because I distinctly hold that in all cases there is an implied obligation that the seller or maker not only should know that what he is selling will do all it is supposed to be capable of, but that he should not take money for apparatus which will not with reasonable perfection do its work.

Probably the most frequent troubles arise from the double dark slides. As regards light leakage who has not suffered? especially with the convenient pull-out ebonite to slides. It should, however, in common fairness, be added that in many cases where the latter are complained of the fault lies in the clumsy manipulating of the users.

False and Uneven Registration.—Totally false registration is more often met with in magazine hand cameras than elsewhere; at least such seems to be the experience of many of the members of my Club, who have on quite a number of occasions found that the registration of the dry plates was such as to produce nothing but grossly out of focus negatives.

Partially False Registration.—This defect is often due to plates not being firmly fixed in the dark slides; hence the whole surface of the plate, or perhaps the sides of the plate, will be found out of focus. Nor are films free from this source of error. An experienced member of the Club distinctly traced the failure of a promising crop of negatives to a convex curvature of celluloid films, causing concentric rings of blue alternating with sharpness. Moral: Be sure that your films are provided with an efficient carrier so that they may be perfectly flat. In former days, when most workers used lenses of about 8 or 9 inch focus, or worked at small aperture, a slight irregularity as regards want of accurate register on the part of a dry plate was not very serious; but in this age of hand cameras, when a lens of *about* 4-inch focus used at large aperture is the ideal, it will be at once recognized that very considerable importance is attachable to ensuring that during exposure the surface of the dry plate shall exactly coincide with that which the ground glass occupied when the picture was focused.

Erratic or Imperfect Action of Shutters.—A relatively large proportion of shutters have the radical fault of not, upon all occasions, and under all reasonable conditions, shielding the plate, while it is waiting exposure, from sunlight. This I have found to be the cause of otherwise quite inexplicable examples of light-fog. Another bad habit which many shutters have is that of failing to promptly open or immediately close. Hence, tolerably often, the confiding amateur, having duly pressed and released the pneumatic bulb, is ultimately surprised to find that he has been either too late or too long. Moral: Watch your shutter's action.

Degradation of Dry Plates.—This has been found a decidedly prolific nuisance. In some cases the process of decay of power seems inherent; especially is this so with extra rapid emulsions; with celluloid films, and with certain makes of isochromatic plates. The tendency to degradation is in all cases very much affected by atmospheric influences; hence the need for keeping the dry plate in a receptacle both air-tight and damp-tight.

Degradation in Developer.—Due to oxidization, to absorption of moisture, to evaporation —as with ammonia—to decomposition, and to other causes, although always happening, is less harmful than many other aids to failure.

Degradation of Non-Actinic Medium.—Is, where isochromatic plates are used, a by no means infrequent source of trouble. More than once, when working away from home and making occasional use of the dark-room of the wet-collodion ferrotype worker, or other humble photographer, my plates have suffered from too much actinic light, due to the fading of the coloring matter of the material used for the window of the dark-room.

Dust.—Whether in dark slides, or in developing dish, is apt to be, like a gnat in one's eye, a small but intolerable nuisance. But without doubt the most serious harm which dust has done is when it has collected upon the back of a lens. Many hand cameras of the magazine type are so constructed that the lens is not to be examined unless the camera be taken to pieces. I have had my attention on several occasions directed to cases of failure with this kind of camera which have eventually been traced to the lens being veiled with a thin film of dust.

Intermittent Obscuration of Lens.—Keep an eye upon your lenses. I can, from personal experience, assure my readers that—especially when the air is humid and hot—condensation of vapor may happen in the interval between focusing and exposing; this has occurred to me more than once.

Holes and Cracks in Bellows.—These I feel sure are often to be blamed for veiled negatives. I have heard it asserted that inasmuch as the average aperture at which lenses are worked is not smaller than, say, *f*/16, and as any holes small enough to escape instant detection would be so minute that a relatively very prolonged exposure would be needed, to fog a plate; therefore, no appreciable harm can come from such defects in the bellows of a camera. But it is forgotten that in the case of holes the exposure is often a hundred-fold or more than is that given by means of the lens. For, working at *f*/16, we may consider $\frac{1}{10}$ second on open landscape an average time of exposure.

Probably 3 minutes will be the mean time which will elapse between drawing the slide and uncovering the lens. Three minutes = 180 seconds = 1800 times the exposure given by the lens. Some there are who frequently allow much more than 3 minutes to pass after drawing out the shutter. That the above is a by no means imaginary source of trouble several of the members of the Croydon Camera Club have given me conclusive evidence ; a sequence of poor negatives giving place to satisfactory ones on the vacant hole being discovered and covered by a patch.

When I commenced these notes it was with a rough intention of exhausting all my experiences upon the subject of those important trifles which lend their often occult aid in the production of photographic failures.

But I find that the theme will run away with more time than I can at the moment spare, and therefore must defer until some other opportunity the completion of the catalogue. Meanwhile let the reader bear in mind that photographic achievement depends almost entirely upon persistent attention to all and every detail of apparatus, chemicals, and procedure.

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SUBMARINE PHOTOGRAPHY.

WHAT the bottom of the sea looks like is a conundrum which people have tried to solve to the best of their ability during recent years. Of course photography has been called in to render its valuable assistance. What has been done in this direction is given by Dr. J. E. Rombouts in the following article, translated and condensed from *De Natuur:*

"The deep sea explorations and dredgings of late years have certainly shed much light thereon, and have acquainted us with much which, earlier, we would not have suspected could exist at the bottom of the sea.

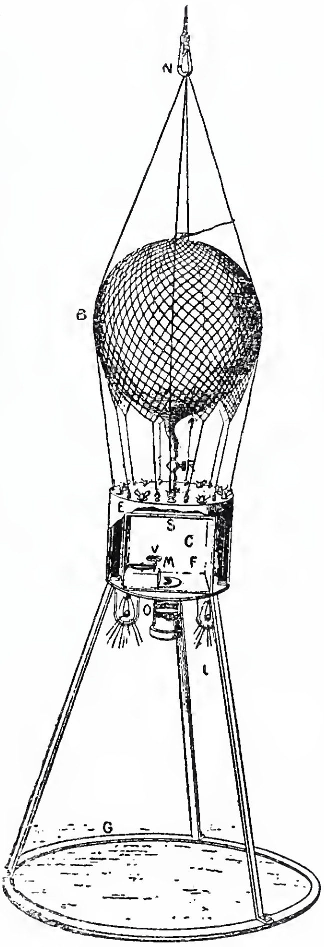

FIG. 1.—REGNARD'S APPARATUS FOR SUBMARINE PHOTOGRAPHY.

"Imagination had pictured the bottom of the sea, at least at great depths, as a wilderness, wherein nothing was to be found save the remains of animals which had lived at the surface. Owing to the absence of sunlight it was supposed no life could exist and no color develop.

"We know from what has already been published concerning the deep sea explorations that the state of things at the bottom of the sea is entirely different. We know that there, as well as on the earth's surface, a great variety obtains. That great apparently uninhabited areas, alternate with densely populated forest regions—sparkling with every color. No wonder that the attempt has been made to record, by photographic means, that which is to be found beneath the surface.

"This was not to be thought of when we were entirely dependent upon sunlight—but at present we have in the electric and magnesium lights means by which to picture even the most obscure places, and by means of photography may wrest from the sea her secrets.

"The first endeavors to accomplish this object were made by 'Regnard.' In his work entitled 'La Vie dans les Eaux,' he gives a description of which the substance follows:

"In the first place the lens must be of a class by which objects both near and remote may be photographed. So-called sharp focusing in the ground glass is not necessary—but one must be able to photograph all objects, no matter at what distance from the objective. In using such a lens under water it must be borne in mind that light rays under water are not exactly in the same manner as in the atmosphere.

"An arrangement must be provided by which the lens can be uncapped and capped at a given instant, and the whole apparatus must be able to resist any injury from the pressure of water to which it is subjected. Regnard's apparatus, of which we give a view, consists of a copper cylinder closed above and below by copper plates; the upper plate rests upon a rubber ring, and can be screwed down securely. In this cylinder is a camera, C, with its sensitive plate—which can be exposed by means of a shutter.

"Below the cylinder is a tripod which upon lowering the apparatus rests upon the bottom. The objective which is in the lower end of the cylinder is thus always at a uniform distance from the bottom. Especial means must be taken to overcome the tendency of the apparatus to rise. The pressure of the water, even at a depth of 10 metres is about equivalent to that of the atmosphere.

"The pressure is overcome by means of a balloon, B, which is filled with air, and which is connected with the interior of the camera by a tube. When the cork, R, is open, as the apparatus sinks the balloon, B, is compressed and there is an equilibrium of the pressure within and without the camera. The shutter is opened and closed by means of clockwork, the speed of which is regulated by means of a fan, V.

"The illumination is by electric light furnished by accumulators which are contained in a space around the cylinder. Two incandescent lamps stand on each side of the objective, and are provided with strong glass protectors. It is evident that the accumulators would soon be exhausted in case they were continuously employed. An arrangement is provided by which the current is turned on the moment the exposure is made. The light is thus used only during the exposure. The apparatus is lowered overboard by means of a cable."

Fig. 1 shows the apparatus. S is the plate, M the shutter, LL, the electric lights operated by means of an accumulator. Whether the apparatus produced good photographs is not known to the author, he never having seen the results.

Lately M. Bouton has succeeded in making photographs of the bottom of the sea, but he employed the magnesium light instead of electric. M. Bouton describes in *La Nature* the working of his apparatus.

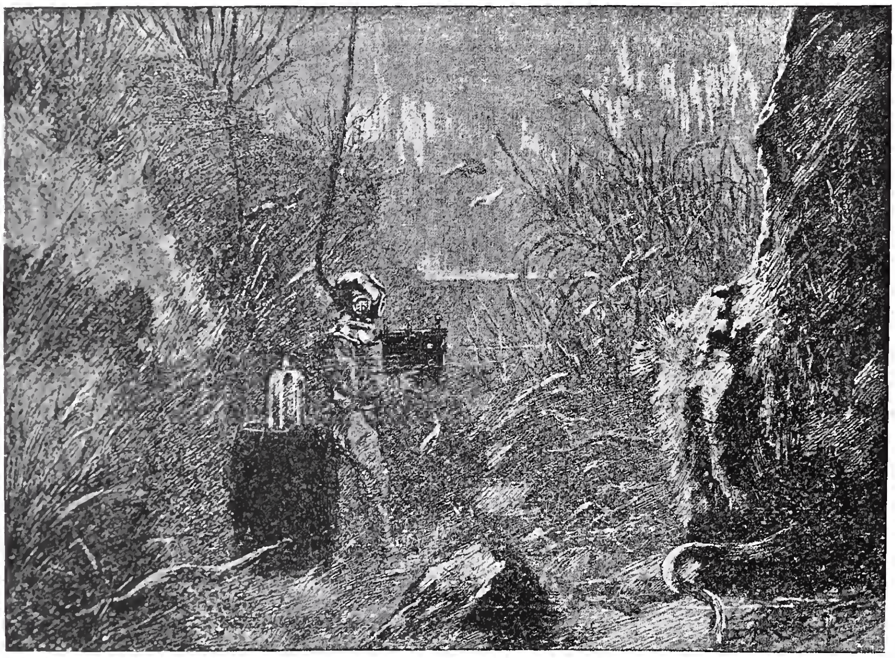

FIG. 2.—SUBMARINE PHOTOGRAPHY. BOUTON'S METHOD.

"An ordinary photographic camera, whose lens has a fixed focus, is enclosed in a metal box in the form of a rectangular parallelopipedon. Transparent glass plates are arranged in front of the lens and over the finder."

Suitable means are provided by which the lens can be uncovered and the plate exposed; also the plates changed. A rubber balloon, filled with air and connected with the metal box containing the camera, serves to compensate for the water pressure as in the before described apparatus by Regnard. The whole rests upon a strong tripod provided with weights to make it more stable. When used in water too deep for sunlight to penetrate, artificial illumination is necessary. The latter is employed by Bouton in the following manner:

"An alcohol lamp, protected from the water, is placed on top of a receiver, of about 200 litres capacity, which is filled with oxygen. The lamp is protected by a bell glass, which is firmly secured to the receiver. Opposite the flame is a tube which is connected with a reservoir which is filled with magnesium, which can can be blown through the flame in the usual manner. When the apparatus is submerged, a simple compression of the bulb is necessary to project the magnesium powder into the flame. Three grammes of magnesium may thus be burned. When operating near the shore at a depth of about one metre, no artificial light is necessary, and with an exposure of about ten minutes, good pictures may be obtained. For greater depths it is necessary for the operator to descend to the bottom in order to select the view, and to set the apparatus, so that he may be certain that he may secure what he desires to photograph."

When operating at a depth of six or seven metres, the exposure should be of thirty minutes' duration. In order to secure sharp pictures the author deems it necessary to employ a color screen in front of the objective, and good results were obtained only in still water. When operating by magnesium light, this condition is not altogether necessary, as Bouton obtained good pictures in rough weather.

The accompany cut shows the manner of making a submarine photograph by Bouton's method.

THE TEGEOTYPE PROCESS.

BY P. C. DUCHOCHOIS.

ALTHOUGH known by very few photographers, the processes we are going to describe under this new name, Tegeotype—from the Greek, *τεγγείν*, to color, and *τμπος*, image—are not new. They originated from the toning processes employed in carbon printing and the aniline processes published by Willis, Geymet, and the writer.

One knows, from a phenomenon discovered by Poitevin, that gelatine, insolubilized by the reduction of chromic acid, repels water, hence, if a dry film of bichromated gelatine be exposed to light under a negative, the parts acted on become insoluble and repel water, while the non-acted parts do not. Therefore, if, after exposure, one flows over the whole film a coloring solution, these parts absorb it, and the result is a monochromic image. Of course a diapositive should be employed to obtain positive impressions and a negative to obtain duplicated negatives. The latter application of the tegeotypic processes is probably the most simple manner of duplicating both diapositives and negatives.

FIRST PROCESS.

Prepare:

Cox's gelatine	50 grains
White of eggs	5 minims
Water	1 ounce

Dissolve the white of eggs in water; into this immerse the gelatine and when it is swollen melt it at a slow fire, then just boil the solution and filter through flannel. This has for its object the clarifying of the solution.

Before coating, the glass plates (quite clean) should be rubbed with soluble glass—silicate of potash—diluted in twenty parts of water, then laid flat and coated with the warm gelatine solution in the proportion of from 15 to 20 minims to the square inch. The gelatine coating should necessarily be allowed to form into a jelly before placing the plates on the rack to dry sheltered from dust.

The gelatine film is sensitized by immersing the plate for three minutes into

Ammonium bichromate	12 grains
Water	1 ounce

then drained and sponged to prevent the bichromate from crystallizing while the sensitive films dry in the dark-room. The plates will keep for a week.

When the film is *quite* dry it is exposed in the shade under a cliché for a period varying with the opacity of the image and the quality of the light; it is sufficient when the chromic image is visible and stands out with all the details in brown on the yellow ground of the film.

On its removal from the printing frame the plate is immersed into a tray full of water several times renewed, to wash out the bichromate, and, this done, allowed to dry, when it is colored by immersion into one of the following baths. Drying the film is not absolutely necessary, but recommended; the resulting image is more brilliant:

VIOLET BATHS.

1.

A solution of potassium permanganate.

2.

Acetate of manganese protoxide	5 grains
Logwood extract	270 minims
Vinegar (wine)	½ ounce
Water	½ ounce

The logwood extract is first dissolved in vinegar, the water and manganese acetate are afterward added.

INDIGO BLUE BATH.

Indigo, powdered	90 grains
Sulphuric acid	320 minims
Water	1 ounce

The indigo should be slowly heated with the sulphuric acid in a flask, and when the indigo is discolored, the water, *heated to 95 deg. or 100 deg. Fahr.* is added.

PRUSSIAN BLUE BATH.

Prussian blue	200 grains
Oxalic acid	200 grains
Water	1 ounce

The Prussian blue should be selected, the commercial product not always being soluble in oxalic acid. The bath is prepared by heating.

This and the indigo baths can be neutralized by chalk or by ammonia, not in excess. The latter bath (indigo) is decidedly too acid.

GREEN BATHS.

1.

A mixture of carmine of indigo and sodium picrate.

2.

Prussian blue	200 grains
Picric acid	200 grains
Oxalic acid	60 grains
Water	1 ounce

YELLOW BATHS.

1.

Picric acid	48 grains

2.

Gamboge	200 grains
Saffron	200 grains
Water	1 ounce

All these baths can be concentrated by evaporation or diluted according to the purpose desired.

The aniline colors may be employed: violet, blue, eosine, red, black, etc.; but they are not generally as permanent:

Aniline color	20 to 60 grains
Water	1 ounce

The permanency of colors has a great importance in the industry. We advise the reader interested in this question to consult the remarkable work of Mr. Rood on the *Théorie scientifique des couleurs*.

In the color bath each part of the film forming the image absorbs a quantity of liquid proportionate to its greater or lesser solubility resulting from the luminous action during the exposure time. After a certain period the plate should be washed to ascertain whether the intensity, or, in other words, whether the quantity of aborbed coloring solution is sufficient; if so, the washing is continued until the whites are cleared, when the film is allowed to dry spontaneously. During the washing the intensity of the image is reduced, and this so much the more as the washing is more prolonged, hence one must let the image absorb a greater quantity of coloring liquid than it is at first apparently necessary.

Gelatino-silver bromide plates which were accidentally exposed to light, worthless negatives—*provided the film has not been insolubilized by alum*—can be employed in tegeotypy. It suffices to dissolve the silver salt of the former in a *fresh bath* of plain hyposulphite of sodium, and the metallic silver of the negatives by immersion in a strong Farmer's reducing compound:*

Potassium ferricyanide	25 grains
Sodium hyposulphite	100 grains
Water	1 ounce

The films should be afterward thoroughly washed, then dried and sensitized as has been explained.

Second Process.

The process described in the following lines entirely differs from that explained above. Gelatine is no longer the medium to hold the photographic image; albumen is substituted, and after it has been insolubilized in presence of the bichromate by the agency of light under a cliché, the non acted parts of the film are dissolved before coloring. Hence the negatives should be in line, and the so-called half-tint images obtained by an artifice as in phototypography, that is, by means of ruled screens.

Very effective pseudo-stained window glasses are made by this process; and for the purpose presently in question, it should be preferred to the gelatine process, albumen not being liable as the gelatine to scale by a long exposure to sunlight and the various influences of the atmosphere. We need not to repeat here that the selection of fast colors is most desirable.

The stock solutions to compound the sensitive medium are prepared as follows:

A.

Best gum arabic, powdered	30 grains
Water	1 ounce

Dry egg-albumen	110 grains
Water	1 ounce
Ammonia	15 minims
Glycerine	10 minims

The dry albumen is placed in a large-mouthed stoppered bottle, together with the ammonia, glycerine and water, when a few hours afterward it will be found softened and ready to dissolve. This being done, the gum arabic solution is added, the whole beaten to a thick froth, and then allowed to set. The clear liquid decanted in a vial will keep for a long time.

When dry albumen cannot be procured, the mixture can be prepared thus:

Gum arabic	20 grains
Water	2 drachms
Glycerine	8 minims

One dissolves the gum, then adds

White of eggs	2 ounces
Ammonia	10 minims

Add proceeds, as said above.

B.

Ammonium bichromate	50 grains
Water	1 ounce

For use, mix 1 (one) ounce of A with 25 minims of B and filter. This solution should be used within three days, the day of its preparation, if possible.

This albumen solution is pretty thick. It does not run easily on the plate—which should, of course, be perfectly clean—and to facilitate the coating, one cannot wet the plate as may be done in other processes where albumen intervenes as a substratum or a working medium, for the film should have a certain thickness to obtain a vigorous image, the intensity being in direct relation to the quantity of coloring matters the film is capable of retaining. However, one can breathe on the plate, whereby the albumen solution will flow more easily, or one may use a card-board triangle to spread it. The plate, after draining, can be placed on the turning table, not to obtain a thin coating, but to equalize it: I repeat it, the film should have a certain thickness to give a picture sufficiently intense.

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* It should be prepared in a small quantity for immediate use. It does not keep.

When one has not a drying box made *ad hoc.* at his disposal, the film should be dried in the following manner, which has the advantage to prevent the crystallization of the bichromatic salt; the plate is laid on a tripod and then *very slowly and equally heated with an alcohol lamp until steam commences to be evolved, and no more,* in order not to insolubilize the albumen; immediately after heating the film is fanned with a card-board until the plate is cold. By repeating once or twice this operation the film is dried in a few minutes and ready for exposure. When the albumen becomes sticky the heating must be discontinued, for there is then much danger of insolubilizing it. This, the drying, may be done by diffused light, but as soon as the film is dry it should be kept in the dark-room until wanted for use.

It is important that the clichés, negative or positive, be intense—just as for any one of the processes by development with bitumen, gelatine or albumen, in order that one may lengthen sufficiently the exposure time to insolubilize through to the glass the parts acted on by light, otherwise the under layers of the same, being soluble to a certain extent, are washed off during the development, carrying with them the upper insoluble parts. This observation should be borne in mind, most of the failures in the processes in question arising from underexposure, *i.e.*, the incomplete insolubilization of the parts forming the image.

The plates should be exposed in the shade; in the sun good results are seldom obtained: the whites of the picture are veiled. The exposure time varies as usual with the actinic quality of the light and the intensity of the negative. In clear weather from five to ten minutes' exposure is sufficient; if the sky is overcast it may require half an hour or more.

To develop, the plate is immersed for, say, ten minutes in a tray of water on its removal from the printing frame, then washed for a short time under the rose tap, placing it near the jets in order that their pressure does not break the very fine lines of the design.

The development presents no difficulty whatever; the albumen not acted on conserves its original solubility and, therefore, when softened, it is easily and entirely washed off by operating as said above. When this is done, the plate is drained for a few seconds, then immediately flowed with the coloring solution. It must not be allowed to dry before; this is a very necessary condition to obtain good results.

All the *transparent* coloring matters soluble in alcohol at 95 deg. can be employed.

Among the aniline colors the following give very intense negatives and diapositives: *cherry-red, blue B, Poirier's orange* for yellow, malachite green, methymil yellow, chrysoidine R, for orange red, etc.

The vegetable colors soluble in alcohol are:

For red: *carmine, cochineal, madder alizarine.*

For blue: *indigo, indigotine, pastet.*

For yellow: *fustet, quercitron, curcuma, dyer's wood.*

For brown: *nut-gall, sumac, cachou.*

The colors soluble in water can also be employed, but on condition that the solution be heated to the boiling point in order to complete the coagulation of the albumen, which is the important point of the process. It is for this reason we prefer alcohol, which simplifies the operation.

The colors should be prepared in very concentrated solutions, and the solutions filtered and heated, by means of a water bath, before use.

The plate, while still wet—we insist on this point—is twice flowed with the alcoholic color solution, then drained for three or four seconds, then allowed to dry, and finally washed to eliminate the color from the whites of the picture, that is, the bare parts of the glass, when it is allowed to dry, and afterward varnished with a varnish prepared with turpentine: alcohol would dissolve the color.

COLORLESS VARNISH.

Mastic	375 parts
Camphor	20 parts
Turpentine, rectified	1250 parts

Dissolve at a slow fire, then add

Venice turpentine	500 parts

* * *

HOW TO MAKE SLIDES BY THE DRY COLLODION PROCESS.

BY MAX D'ABLER.

THERE is something so beautiful about a slide made by the collodion process that one should always be ready and willing to devote the extra time and trouble to get such results as a reward, for, however good the quality of a dry-plate slide, it cannot, in my opinion, compare in richness and brilliancy with the collodion plate.

The formulæ I use was given by Clement J. Leaper, some time ago, in one of the English magazines. Here is my method of working: I procure a number of glass plates and carefully clean them, first with hot soda solution and lastly with distilled water. I next coat them with the substratum made by dissolving 10 grains of gelatine in 10 ounces of water. I prepare a number of pieces for future use, stacking them in the racks with the coated side always to the right, so that I shall always know which side the film is upon. When I require to sensitize these plates with the collodion and silver I remove them to the dark-room. Here I have two dishes, one containing the sensitizing bath, composed of

Silver nitrate	120 grains
Distilled water	4 ounces
Nitric acid	1 drop
Collodion	2 drops

and the other the preservative, the ingredients of which are

Ground coffee	120 grains
Gum arabic	40 grains
Sugar candy	60 grains
Water	6 ounces

The coffee is boiled for 10 minutes with 5 ounces of the water. The other ounce is used to dissolve the gum arabic which is then added together with the sugar.

The collodion I use is made up with

Plain collodion	6 drachms
Absolute alcohol	72 drachms
Ammonium iodide	4 grains
Cadmium bromide	2 grains
Iodine	½ grain

prepared sometime previously and allowed to settle.

With a pneumatic holder I take hold of one of the plates and hold it gelatinized side up. I pour on a little of the collodion at the top right hand corner and by gently inclining the plate I cause it to run all over. When the whole is covered, I pour off the excess into another collodion bottle. By using two bottles I prevent air bells from being formed in the collodion I am using.

I work the plate to and fro until the collodion has set, and after half a minute or so I lay it film side up in the bath containing the silver solution. In this I allow it to remain for about four minutes and then remove it, allow it to drain for a minute or so, and then wash it for two or three minutes under a tap. Next it goes into the preservative solution and here it stays for three or four minutes when I remove it and place it in a warmed spot to dry. My plates prepared in this way keep for two and three weeks without showing any signs of deterioration.

The method of using them is this: I expose by contact or in the camera, and place the plate into a dish of water; in the winter time this should be warmed. Whilst it is soaking in this I take an ounce of the following solution:

Pyro	20 grains
Citric acid	20 grains
Water	10 ounces

and two drops of

Silver nitrate	20 grains
Water	1 ounce

added to it.

After the plate has been soaked in the water, I remove it and place it under the tap to ensure the removal of all traces of the preservative, after which I pour the developer all over. It will require, as a rule, about two minutes before the image makes its appearance, and about ten or twelve before development is completed.

I fix in a solution of potassium cyanide, 20 grains to the ounce, wash for a few minutes, dry by artificial heat, and my slide is ready for masking and mounting.

There are one or two other points I might mention. In making up the gelatine substratum, first let the gelatine swell up completely in the water before heating; when dissolved, filter through flannel or chamois leather.

In preparing the silver bath, after dissolving the various ingredients, place the whole in a clean glass bottle, and stand this in the sun for a day. It will form then a brownish yellow; the substance which forms the coloring matter will, however, settle to the bottom and the clear solution can be decanted off.

Avoid dust as you would the plague. When your plates have been coated with the substratum and dried, cover them up well and protect them from dirt.

THE MECHANICS OF DEVELOPMENT.

BY R. ED. LIESEGANG.

IN what way is a negative produced from the latent image of a bromide of silver gelatine plate?

It has been customary to answer this question by simply saying:

"The developer continues the action of the light," or "Light converts the bromide of silver into a salt containing less bromine, and this sub-bromide of silver is reduced to metallic silver by the developer." But these two answers being contradictory, it is impossible that both should be correct.

It is impossible to obtain so brilliant a picture by continued exposure to light of a dry-plate, as by development. It is even highly improbable that bromide of silver in the form and mixture in which it is contained in a dry-plate, can be reduced to a metallic state by the action of light.

The second answer, which pre-supposes that the action of light and of the developer are different in principle, is somewhat more in accordance with the facts, but a study of the other reactions of the argentous bromide reveals at once that this theory is, at any rate, incomplete.

If a dry-plate is exposed to the action of light, and is then immersed in a bath of hyposulphite of soda without being developed, a brilliant picture can be developed out of this clear plate with nascent silver (*Photo. Archiv*, 1893, p. 67.). Some silver must, therefore, have been retained in the emulsion in those parts which had been exposed to the action of light.

It is possible to reason from other reactions as well with comparative certainty, that hyposulphite of soda decomposes the sub-bromide of silver into bromide and metallic silver.

$$Ag_2\,Br = Ag\,Br + Ag.$$

Hypo must, therefore, be able to do half the work which developers do, as these latter, according to the theory hinted at above, produce the decomposition as follows:

$$Ag_2Br = 2Ag + Br.$$

One of these theories must be incorrect, for nobody will maintain that the strongly developed negative contains only twice the amount of metallic silver as that which has only been exposed to the action of the hyposulphite. (*Zur Theorie der Chemischen Entwickelung*, *Photo. Archiv*, 1894, p 81.)

The developer reduces the light-struck bromide of silver in a normally exposed plate; this is unquestionably correct, as well as the statement that it does not reduce the bromide of silver in a plate which has not been exposed to light. This does not exclude, however, the fact that in the plate exposed to light such bromide of silver should be reduced which has not been struck by light, as well as that which has. This is probably due to the peculiar structural conditions in the photographic emulsion, conditions which are also to be taken into consideration in the study of printing-out processes. (*Die Anatomie der Photographischen Schichten*. *Photo. Archiv*, 1894, p. 4.)

It is well known that, in the preparation of bromide of silver gelatine emulsion, a number of bromide of silver molecules are allowed to gather into groups. (Ripening of the emulsion.) The finished dry-plate, therefore, contains more or less granular bromide of silver. During exposure, these groups are decomposed on one side only: on the side toward the light, a molecule is found which is poorer in bromine, possibly the sub-bromide, in the middle and in those parts turned from the light, unaltered bromide of silver remains, due to the fact that the light has not been able to penetrate so far. Amongst other things, this circumstance makes the analysis of the product formed from chloride of silver by the action of light difficult, and, consequently, also the solution of the problem of the existence of the salts of lower oxidation of silver. Undecomposed chloride of silver is found in the interior of molecular groups, even when chloride of silver suspended in perturbed water in a finely divided state, has been exposed to the action of light for a long time.

Molecules of bromide of silver and of sub-bromide are, therefore, in close juxtaposition. Such a group, represents, in a way, a chemical individual, and reacts quite differently from a mere physical mixture.

Such a structure may be the cause of the peculiarities of Lea's photo-salts. (*Photo. Archiv*, 1893, p. 85.) It is possible that galvanic processes may enter when these groups are exposed to light. But this supposition is not at all necessary. A purely chemical theory will also explain the "ferment-like" continuation of the reduction from the exposed to the non-exposed molecules of bromide of silver during development. (Ferment-like, I would also call the process of combustion, because the oxidation, when begun, furnishes the source of heat which is necessary for the oxidation of adjoining parts).

The alkaline developer reacts as follows on the group of molecules which may be symbolized in the following manner: Ag_2Br, $AgBr$, $AgBr$. Bromine is taken from the first molecule, consisting of sub-bromide, and two atoms of silver are set at liberty. It is possible that in a nascent state, one atom of silver may combine with the adjoining molecule of bromide of silver. This would result in the molecular combination

$$Ag, Ag_2Br, AgBr.$$

Similarly the developer reacts in a reducing sense on the molecule of sub-bromide thus formed, producing

$$Ag, Ag, Ag_2Br,$$

and so on, until, finally, the whole group is reduced to metallic silver. The larger the group of bromide of silver was originally, the longer can this ferment-like reduction in the developer be continued. This would explain why the strongly ripened (coarsely granular) emulsion is apparently more sensitive to light than one which has been allowed to ripen a lesser time. (*Photographische Chemie*, p 84.) A few computations, published by Kogelmann in his pamphlet, "The Isolation of the Substance of the Latent Photographic Image," can be fitted accurately into the theory thus developed. (*Photo. Archiv*, 1894, p. 306.) Nevertheless, I would have the same looked upon solely as a working hypothesis, as I dread a retarding influence upon science from every closed system. I would simply like to warn against the assumption that chemistry alone will furnish a solution to the photographic problems. As in the action of living organisms, so also in these, chemistry and physics must go hand in hand.

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PORTRAIT STUDY. BY ARTHUR & PHILBRIC.

THE PHOTOGRAPHY OF SNOW FLAKES.

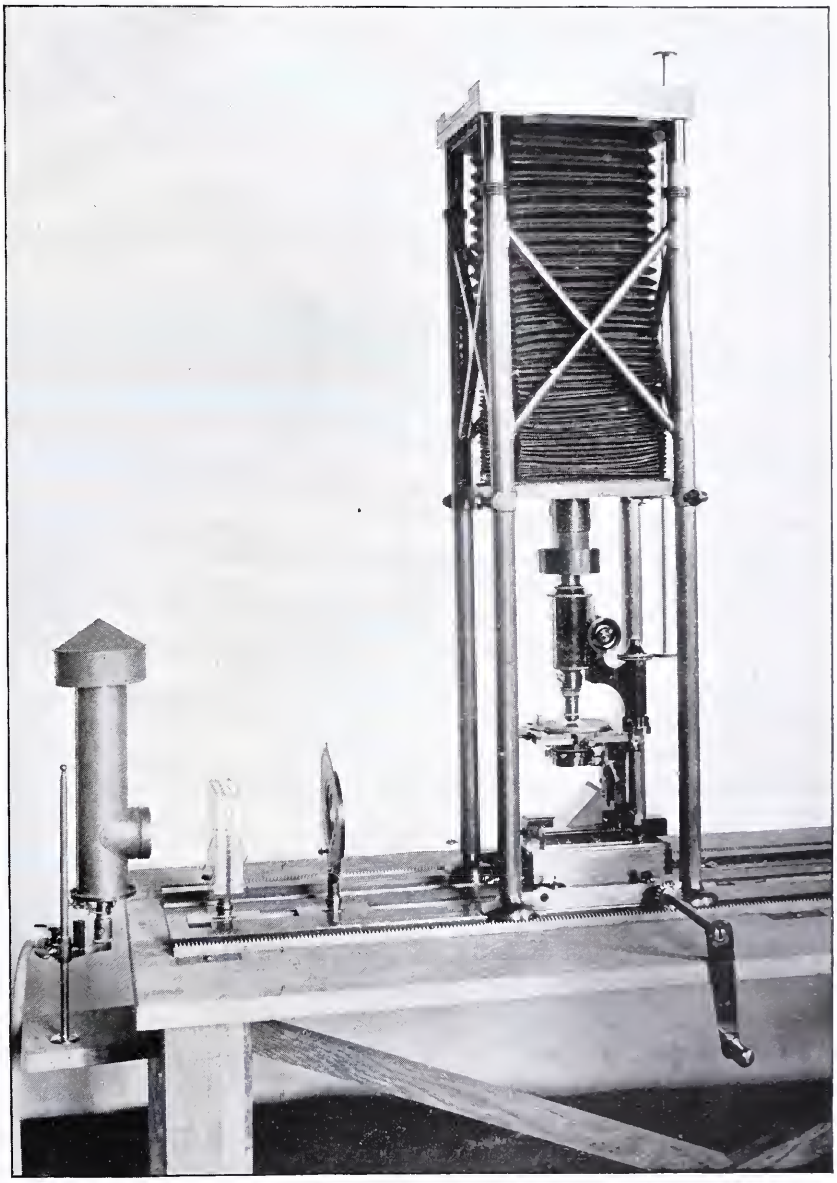
BY PROF. G. NORDENSKIÖLD.

[*Academy of Sciences, Stockholm.*]

THE regular and beautiful form of the snow stars seems always to have excited a lively interest among scientists. OLAUS MAGNUS, the author of the celebrated "*Historia de Gentibus Septentrionalibus*," gives in this great work, published in 1555, the first figures of snow crystals. In 1611 KEPLER produced a pamphlet entitled "*Strena sen de Nive Sexangula.*" In the 17th and 18th centuries a great number of papers were devoted to the description of the form and structure of snow. The most remarkable among these is that published in 1681 by DONATO ROSSETTI, a canon of Leghorn. The figures appended to the text are more similar to *photographs* of snowflakes, and consequently more accurate than any drawings yet produced. In the present century GLAISHER and SCORESBY, the famous Arctic explorer, among others, have figured and described snow crystals of many different types.

It is evident that the *drawing* of a snow crystal, which so readily evaporates, or, at the slightest rise of the temperature above the freezing-point, melts, must be very difficult That nobody has ever actually succeeded in drawing a perfectly correct figure of a snowflake is clearly shown by the results of photography when employed in this department of science.

Photographs of snow crystals were first taken, to the best of my knowledge, in 1887, by Mr. ARTHUR W. WATERS, an Englishman. In 1890 I made my first experiments in this line, but it was not until the winter of 1892–93 that I commenced my systematic endeavors to elucidate the different forms of crystallized snow. During the same winter R. NEUHAUSS, of Berlin, took a number of snow photographs. He, however, used low power lenses, and the most interesting details in the structure of the snow stars have consequently escaped him.



APPARATUS EMPLOYED BY PROF. NORDENSKIOLD FOR PHOTOGRAPHING SNOW CRYSTALS.

I formerly used a common vertical photomicrographic camera in combination with a Siebert microscope. But for last winter's work I constructed an apparatus designed especially for snow photography (see cut above). The upper part of the camera (answering to the back of an ordinary camera) is carried by four brass tubes telescoping into four other tubes of the same length. By means of this arrangement the camera may be drawn out to nearly twice the length shown in the figure. Conical screws are set around the upper ends of the outer tubes, and the upper part can thus be fixed at any height. The lower (front) end of the camera consists of a square board, to the corners of which are attached cylindrical set-screws fitted round the outer tube and movable along the same. The centre of the board carries a short tube, worked by a milled-head-screw, and fitting into a cap applied to the ocular end of the microscope.

The fine adjustment is simply worked by a metal rod bearing at the lower end a small wheel, round the margin of which is stretched a rubber band. The rod passes through a hole in a small elongated brass plate, which is fastened to the board at the lower end of the camera by a screw inserted through a slot in the plate. The rod and the wheel can thus be moved a short distance in an horizontal direction. When the camera has been brought over the microscope, the wheel is slightly pressed, by means of this screw, against the milled screw of the fine adjustment, and the adjustment may easily be worked by turning the head of the rod.

Each of the four tubes supporting the camera rests on a circular brass foot, furnished at the bottom with a T-shaped slot. These slots run on a pair of T-shaped rails fixed to a solid table, and the whole camera may thus be moved along the table by means of a rack-and-pinion mechanism. This arrangement enables the operator in a few seconds to bring the camera into position, exactly in the axis of the microscope, a condition of great importance in the kind of work under consideration, where a delay on his part may be fatal to the result.

The manipulation of snowflake photography does not differ greatly from that observed in other classes of photomicrographic work. The difficulties consist principally in the tendency of the minute snowflakes to melt, or evaporate. When the atmospheric temperature is well below the freezing-point the melting is easily prevented by taking care not to touch the stage of the microscope or the slip of glass bearing the object with the hand.

At a temperature of only a few degrees below the freezing-point the work becomes very difficult, and freezing mixtures must be used to keep microscope and glass slips cold. The rapid evaporation of the snow is a more serious difficulty, and causes the operator great inconvenicce. A snowflake lying free on a slip of glass will begin to lose its regular form and within a minute, or less.[*] A thin cover-glass does not damage it in the least, and considerably retards the evaporation. The ice vapor, however, sometimes forms spots on the glass. In my experience the best way of obtaining a good photograph of a fine crystal is to place it quickly on a glass slip, put a small drop of a colored liquid on it and lay the cover-glass over. The liquid must, of course, have a low freezing-point. I used aniline oil, in which an aniline color had been dissolved. In this liquid the most delicate star would remain entirely unaltered for hours.

The observing and photographing of snow crystals in a colored liquid is of great interest. The oil slowly penetrates into the cavities and narrow canals, which are nearly always present in a snow star or table. This is a proof that the curved lines, often very complicated (see the figures), in the interior of the crystals mark the limits of regular, flattened cavities, bounded by sinuous surfaces. In many crystals these cavities are closed (Fig. 2). In others, especially in the star-like varieties, they take the shape of slender double canals, radiating from the centre (Fig. 3), and usually forming the middle of the six arms.

The kaleidoscopic wealth of form displayed by these figures in the interior of snowflakes renders the photographing of snow stars a very fascinating pastime. Anybody who possesses a microscope and a camera may easily construct an apparatus with which he can take good snow photographs.

If the lenses are not apochromatic, orthochromatic plates and a light-filter must be used. Those who wish to give their snow photographs a scientific value should always make full meteorological observations once or twice a day so long as the work is in progress. With a large stock of such observations it might perhaps be possible to ascertain the conditions under which the different forms of crystals are generated. The north-east of the United States, with its cold winters, is, no doubt, a region highly congenial to this kind of work.

(All the snowflakes shown in the figures, with the exception of Fig. 3, are photographed against a black background by using an "opaque-centre stop.")

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[*] The snow crystals photographed by Dr. R. Neuhauss are good evidence of this. He does not seem to have paid any attention to the rapid evaporation, and he used no cover-glass. The result is that nearly every star has lost the original form, which is bounded by mathematically regular straight lines, in accordance with the laws of the hexagonal system of crystals.

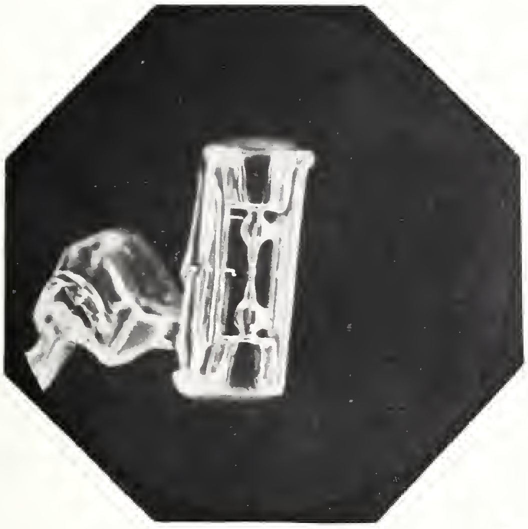


Fig. 1.

Snow Prism with an
Hour-Glass shaped cavity.
x 70.

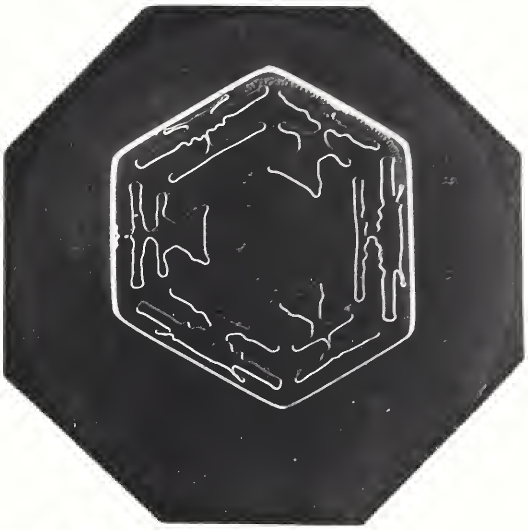


Fig. 2.

Tubular Snow Crystal,
with Six Closed Cavities.
x 70.

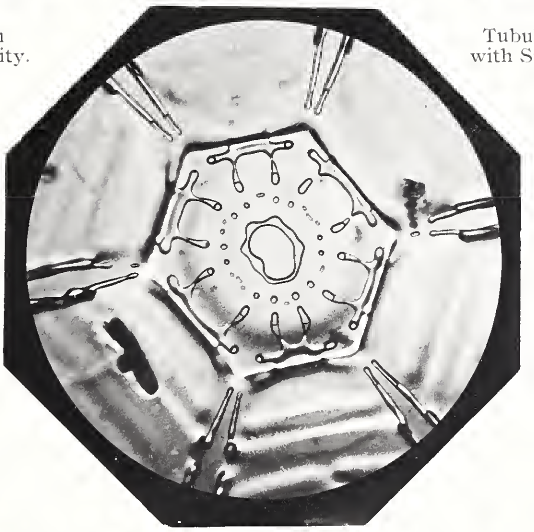


Fig. 3.

Centre of a Snow Flake,
Showing cavities and canals partly
filled with a liquid.
x 140.

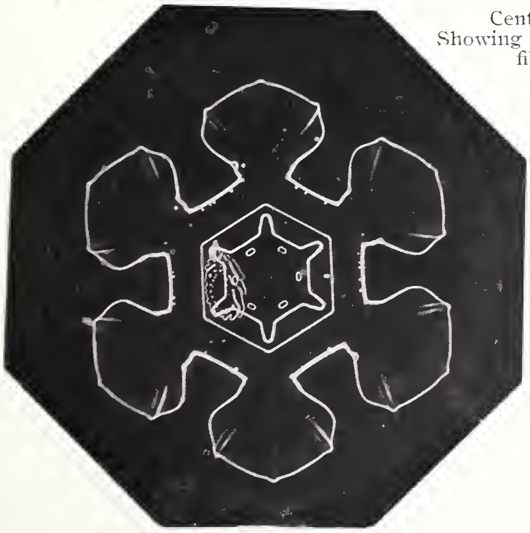


Fig. 4.

Snow Star.
x 70.

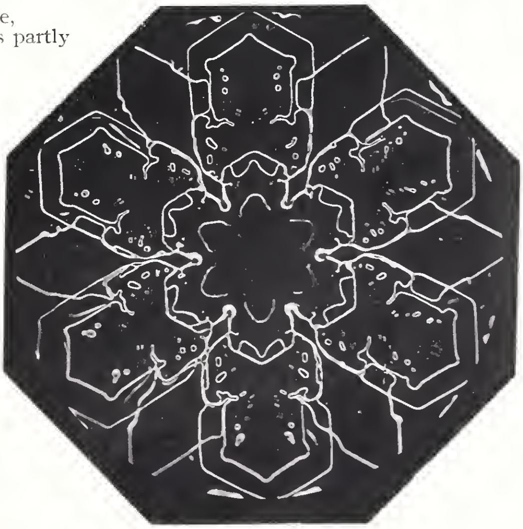


Fig. 5.

Central Star of a Large Flake.
x 70.

PHOTOGRAPHS OF SNOW FLAKES.

By Prof. G. Nordenskiöld.

(ACADEMY OF SCIENCES, STOCKHOLM.)

ARTISTIC PHOTOGRAPHY.

BY J. S. HODSON, F.R.S.L.

THE coveted goal at which most amateur photographers aim is to excel in that department which we proudly dignify with the appellation of "Artistic Photography"; but at the outset we meet with a difficulty in deciding what may specially entitle us to adopt so exalted an attribute to any phase of photography whatsoever.

Some there are who put their faith in the exercise of sharpness and elaboration of detail which a good lens so admirably affords, and which is indeed the salient phase of photography and most forcibly attracts the notice of those who at first essay to make use of the camera. On the other hand, a comparatively new school has arisen adopting the opposite extreme by dispensing with the lens altogether, contenting themselves with a pin-hole arrangement through which the image is to be reflected, thereby producing a haziness in the picture. When to this is added the use of a rough drawing paper fitly sensitized for printing, the acme of perfection in artistic photography is supposed to have been attained. The painter, again, from his exalted standpoint, settles the question in his own authoritative and emphatic way by declining to accept as artistic any production of the camera, looking upon photography as absolutely mechanical and chemical, and, therefore, having no relation to art whatever.

To this conclusion I am bound, as an enthusiastic photographer, to demur, and I appeal with some confidence to those of my confrères, whether amateurs or professors, who have had any experience in the matter.

There is, I submit, so much in common between the artist and the advanced photographer, that it is but fair to expect in our estimate of the highest style of photographic results that some artistic training should be credited to the photographer, just as we naturally presuppose special training in a painter.

Not altogether inappropriate to the subject in hand is the old story which tells of an ardent admirer of the skill of a painter seeking information from the artist himself as to the wonders involved in his profession. Innocent as the questioner was of any practical knowledge of the subject, he was all the more attracted by the marvelous results produced by the artist from his palette; and noticing the apparently inexhaustible variety of tints which he evoked therefrom, he ventured to ask, as the key to the mystery, with what wonderful ingredient he mixed his colors. "I mix my colors with brains," blandly replied the artist.

I have often thought that the artist's reply might with at least equal propriety have been adopted by a photographer as by an artist. Each desires, with the material at his command, to produce a result that shall exemplify his own conception of what is artistic; and to this and the exercise of judgment and discrimination is as essential to the photographer as it is necessary for the artist to "mix his colors with brains." The artist is in every way a free agent, while the photographer is in great measure "cabined and confined" by difficulties inherent in his vocation, of which the artist has no experience. Should he conceive that in the execution of his task certain parts of his subject might with advantage be altered, or emphasized, or even altogether dispensed with, he does not scruple to exercise and act upon his own judgment in the matter. The photographer, on the contrary, is handicaped in more ways than one. He cannot adopt either of the popularly suggested alternatives of altering or expunging any elements that may mitigate against the artistic effect of his picture, but is bound to reproduce all that he may find in nature, and must content himself with impressing upon the result of his exertions whatever artistic feeling he may possess.

The photographer's sheet anchor is undoubtedly the opportunity of exercising his "brains" in the artistic selection of his subject, and (in so far as this may be under his control) in the modification of the lighting arrangements also. When at work "in the open," it is manifestly impossible to alter the position of the source of light; but the photographer can show his "art" by the selection of the point of view from which to take his picture, and also by his choice of the hour of the day when the scene will be most effectively lighted. Occasionally we meet with the work of an eccentric genius who, for the sake of an effect, will set the rules pertaining to "lighting" at defiance, and an example occurs to me in the work in black and white of Gustave Doré; but then the photographer must establish his right to be considered a genius before presuming to ignore laws like those of the Medes and Persians.

This brings me to call attention to the fact that although painters, from their presumed superiority in artistic matters, look down with supreme contempt upon the work of the photographer; yet the recognized laws which govern the one equally apply to the other method of producing pictures. The laws relating to that which is technically called "composition," by which the correct position of the lines of a picture are regulated, and "chiaroscuro," by which the massing of light and shadow are controlled; these are important factors in the success of a picture, whether produced by a painter or a photographer. Seeing that the photographer is deprived of the aid of color, and has to work in monocrome, the necessity for a study of these theoretical elements of artistic knowledge is the more necessary.

A strict adherence to these laws by a photographer will assuredly enable him to produce work well entitled to be styled "artistic"; and the exhibitions of the photographic societies on both sides of the ocean afford abundant proof of the truth of the statement. In such exhibitions there will be found not a few pictures that contain such details of artistic excellence as a painter may recognize, and even envy.

* * * *

SIMPLICITY.

BY H. EDWARDS-FICKEN.

OF the making of books there is no end, and very many in late years have been devoted to photography, and the greater part of these dedicated to the amateur and the beginner.

Successive editions of these books prove their demand, which is good for their publishers, and the numerous photographic exhibitions give evidence of the amateur and the beginner having arrived at a technically expert stage in the making of a photograph, presumably the result of the early teachings of the books.

But are the photographs in any sense artistic compositions, or, *pictures?* Here and there, the more remarked in their excellence, because of their rarity, are to be found the few that breathe of art.

Yet all the works published on photography give at least one chapter, and always a sensible one, on composition, while masters of art have given entire treatises to it, and illustrations of it at the very best are constantly before the photographer at every turn and in every form, whether as reproductions from the originals in the picture galleries, or the most admirable work of our best draughtman, in the weekly and monthly magazines that flood the land.

There is, however, one moral, seldom inculcated, and never strongly enough, in the literature of photography, but always present in the best illustrative work, which ever seems to escape the photographer, and this is SIMPLICITY.

The lack of simplicity in composition is so painfully in evidence in the great run of photographic work, as to react by its absence upon the critical mind and leave only the involuntary condemnation of the camera as a mere machine for the mechanical reproduction of petty detail.

It seems an actual fact that the ease of picturing an infinite mass of small and unimportant material is the chief fascination in the use of a camera to a distressing large number.

To photograph an entire country from a hilltop; a whole farm-yard in connection with an animal; or, three sides of a room crowded with furniture and ornaments like a bric-à-brac shop, is the thoughtless, ill-considered, perverted, and misguided effort of the average photographer, and principally because his lens and camera will do it for him as easily as to photograph a beautiful rock or tree for his principal foreground, with the distant country stretching away in misty perspective for a mere foreground; or, a group of animals in interesting position made the subject of a picture, a farm-building for a characteristic background; or, one part of a room, a nook, a fireplace, or corner, where a chair, cabinet, or bookcase, gives the character and makes a picture.

In other words, as between the first presentment and the possibilities of the second, simplicity. Simplicity, in its fullest, widest sense applied to the study of the effects to be produced.

Were simplicity ever kept in view, the chief thought, ever the absolute test mentally applied, the subtle sense of the artistic would grow as naturally as one learned to read and write. What to eliminate, what to subordinate, and what only to use, would come naturally with intuitive sense of the best composition.

As the most serious architects go over their designs, rubber in hand, to erase all that can be spared on mature study from their even final sketches, in the endeavor to simplify their work and add to its dignity by the very simplification and absolute erasure of detail and ornament, so should the photographer study his scene with the sole thought of the finished effect.

It can safely be held that simplicity can hardly be carried too far, and certainly not to the beginner, for the lesson once mastered and taken seriously to heart will come to the richest fruition.

The lesson is only to leave out everything that does not add in any way to help the picture to strength, directness, and simplicity.

* * *

LANDSCAPE. BY J. R. v. WENUSCH.

LANDSCAPE AND CLOUDS COMBINED IN ONE NEGATIVE BY THE CARBON PROCESS.

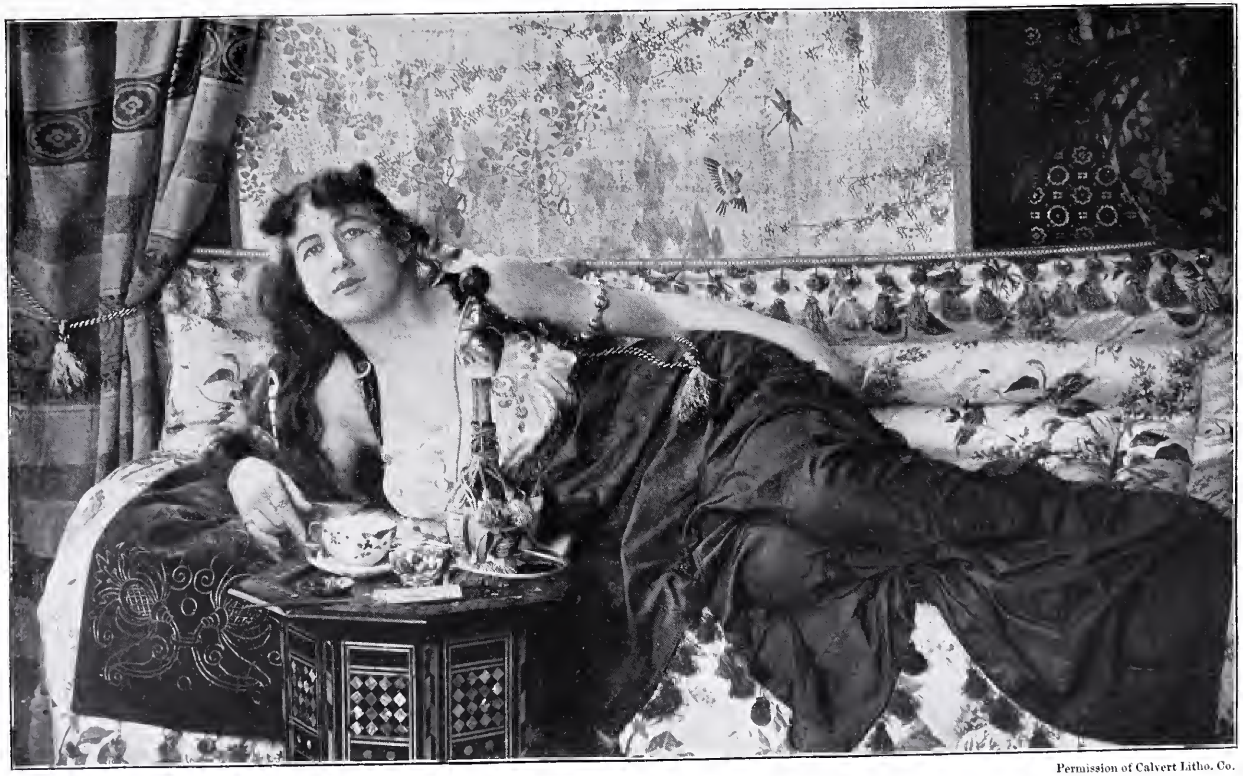
THERE are very few landscape pictures that are not improved by the addition of clouds. Mr. H. P. Robinson deals with this subject, in his masterly style, in another part of this magazine. It is not, however, everyone who can print from two negatives upon the same piece of paper, and so combine the landscape and the cloud pictures to form one harmonious whole. Even if they succeed in making one successful picture in this way, it is but rarely that they can duplicate it. Many methods have been devised to overcome this difficulty. In a recent issue of *The Photographers' Record* a writer gives a plan which, as he says, "may at first sight appear expensive, but, even if only a few prints are required from a negative, the trouble of making a negative in which the clouds are combined with the landscape, and from which the required number of prints can be made by plain straightforward printing, will be as nothing compared with the trouble and expense attending the production of the print when the clouds have to be inserted in each by double printing, with the concomitant loss of material and time in waste prints."

He describes his method as follows:

Expose a piece of transparency tissue behind the landscape negative in the usual way. It may, with advantage, be a trifle over-exposed; that is, the highest lights should not be absolutely clear. Squeegee the tissue upon a sheet of celluloid a size larger than the negative. The celluloid requires no substratum, as the tissue will not frill or reticulate upon it as it does upon unprepared glass, unless extremely hot water is used. It may be here stated, for the benefit of those who sensitize their tissue, that celluloid is an admirable substance to squeegee the tissue upon for drying, as it requires no talcing, and all risk of breaking or cracking the tissue in stripping is avoided, as the celluloid can be bent in stripping while the tissue is held flat.

Develop, and wash the transparency thoroughly. Smears that might not be noticed in a print will impair the usefulness of the transparency. Dry where dust cannot settle upon it, and expose to daylight to harden the image. Dark-toned objects projecting into the sky will mask themselves when the clouds are printed in, but lighter objects must be blocked out. This is best done with Bates's black. Lay the transparency face down on a sheet of white paper, and with a fine-pointed brush fill in all light objects above the sky line. When glass is used as the support, it is impossible to do this with accuracy, owing to the distance intervening between the image and the surface upon which the varnish has to be laid. With celluloid no such difficulty will be experienced, but care must be taken not to overlap the image. Having blocked out these objects, a piece of red or black paper should be gummed over the landscape, shielding it from the horizon downward, leaving the sky portion clear. If the clouds had to be repeated in a river or pool, the water must also be left clear, and the high-toned objects round the banks blocked out. It should be noted, however, that a very faint coloration in the transparency is sufficient to form the mask in the next operation, and consequently little blocking out is required. A strip of the black or red paper must then be gummed round the image, defining the limits of the picture. This acts as a safe-edge, and assists in placing the cloud negative in position. The necessity for such a guide will be perceived later on. All this blocking out and masking must be done upon the celluloid that is on the back of the transparency, The exact height of the horizon line should be clearly marked upon the marginal strips.

For the next operation the worker must sensitize a piece of the transparency tissue for himself; ready-sensitized tissue cannot be used. As soon as the tissue is limp, slip the transparency under it and bring the two into contact while in the bichromate solution, taking care to avoid all air bubbles. The marginal strip of paper will show the position to be occupied by the tissue, which must cover the whole of the picture. Take out of the solution, and squeegee gently, but firmly, into close contact without shifting the position of the tissue. Pin the celluloid down upon a board, and dry it in the dark. It is necessary that the celluloid should not be allowed to curl up, as in flattening it out the tissue may fly off, taking the image with it, and the work will be lost. When dry, the bichromate stains must be cleared of all portions through which the light is to act, without disturbing the black varnish. Exposure



Copyrigh 1894. By E Donald Roberts, Jr.

Permission of Calvert Litho. Co.

A MODERN SULTANA.
BY E. DONALD ROBERTS, JR.

is then to be made for the clouds. As the image on the celluloid is lost in the blackness of the tissue, the horizon mark, marginal strips, and paper pasted across the landscape are the only guides to position. If the clouds are to be repeated in the water, this must be temporarily covered over while the sky is printing. When this is done, uncover the water and shield the sky. Turn the cloud negative upside down with the gelatine side away from the transparency, and print the clouds into the water. Of course, careful actinometer tests must be used in making the exposures. The celluloid is now placed in the developing dish. As the water can only penetrate the tissue from the one side, rather warmer water and a more prolonged soaking will be necessary than in ordinary development. When the tissue is sufficiently softened, the paper support is stripped, and development is proceeded with in the usual way.

And now the full advantage of the method will be perceived. The darker objects will have completely shielded the tissue from light action, and consequently they are not deepened in tone, while, in printing both cloud and landscape on the same sensitive surface, a dark cloud will always impart an increased depth of tone to the objects over which it is printed. It will also be found that, if the sky has been a trifle under or over-exposed relatively to the landscape, it is well within the power of the worker to correct this in development, while, if both were printed on the same piece of tissue, it would be impossible to alter the tone of the sky without affecting the strength of the object projecting into it. Should the sky prove to be hopelessly under-exposed, or so much over-exposed as to be too brilliant or stormy, it can be entirely removed by hot water, assisted, if necessary, by the gentle use of a camel's-hair brush, leaving the landscape intact for a second attempt. This, however, will not be possible if the sky is grossly over-printed, nor can it be done if the print is allowed to dry and harden.

When the correct effect has been secured, and the transparency dried, a negative is made from it on transparency tissue. This will not be reversed; but if made on celluloid, it can be printed from either side, and when used as a reversed negative, there will be very little loss of definition.

The original negatives and transparency may be packed away secure from injury; and, if the carbon negative is injured in the course of working, it can be replaced at little cost.

A variation of the process may also be interesting.

It sometimes happens that, to secure a negative well exposed in the shadows, the sky has been partially reversed, and prints out a dark gray, giving a gloomy effect to the print. To block out such a sky when the horizon line is broken, or when trees rise into the sky, is not an easy task. A few light fleecy clouds judiciously placed would relieve the dark expanse, and give it the appearance of a dark blue summer sky flecked with clouds.

To paint such clouds in would be inadmissible, as being outside photographic methods. Select a suitable sky negative, and make a carbon transparency; at the same time soak the landscape negative in the bichromate solution; dry, and expose to daylight, to make the film insoluble in hot water. From the transparency a carbon negative is to be made. As we cannot shield the trees, etc., projecting into the sky of the landscape negative, the clouds must be confined to the portion of the sky which is clear. To do this, the transparency must be vignetted, only those portions required being allowed to print. This can only be done with a sky in which the clouds are soft and faintly defined.

The exposure of the carbon negative must be very short, as only the white clouds in the transparency are to show, the other portions of the gelatine having to be washed away. The landscape negative and the carbon sky negative are now immersed in water, and, when the tissue is limp, brought into contact, taken out of the dish, and squeegeed together, and the tissue developed in the ordinary way. If the operations have been successfully performed, all that remains is to dry and varnish the negative. Should the sky prove unsatisfactory, it can be removed, while still wet, without injury to the negative, by gently rubbing with the tip of the finger, and another attempt made.

The operators may seem to be involved, but, with care, are easily carried out, and the results are such as cannot easily be obtained by the ordinary methods of masking.

INTENSIFIERS.

BY CAPT. W. DE W. ABNEY.

[*From Photography.*]

IT appears to me that we get into grooves of thought which are somewhat difficult to get out of without something out of the common leads us into others. What will be said about intensifiers may be old to some, but it certainly is new to the writer from one point of view. When we intensify a negative, say one taken by the wet process, we use pyrogallic acid and silver, most probably, and find that weak parts take density, and when the eye judges such density is sufficient we put it away, or in the printing frame, and think nothing more about it. Now let us consider what we have really been doing. If the original part that has been intensified be looked at through a microscope we find that the transmitted light is really cut off, not by a stain on the film, *i.e.*, not by absorption, but by different parts of the light being obstructed by very fine particles of (probably) metallic silver scattered with more or less regularity over the surface. The difference in the light transmitted through bare glass and through the part of negative might approximately be measured by the surface of the total bare glass of a certain area compared with that occupied by bare glass of the same area when occupied by the grains of silver. Now when we intensify a negative, what we do is to increase the surface of these grains of silver, and thus diminish the area of the bare glass. Next, when we intensify a negative with a mercury intensifier, we do pretty much the same thing. The mercuric chloride attacks the metallic silver, and the particles are formed of silver chloride and mercurous chloride; the amount of silver present is the same, but the volume of the particles is increased, and the surface intensified appears white. At this stage there are several ways of proceeding: First, we may reduce the mercury and silver salt by means of ferrous oxalate, and get (what Mr. Chapman Jones states to be the case) metallic silver and metallic mercury combined. The original silver remains, and the additional density is caused by the increase in volume of the particles of the metallic mercury. The mercury image may also be treated with silver cyanide, an intensifier which Mr. Chapman Jones condemns as being uncertain and altering the gradation, but which the writer, it may be mentioned, finds an excellent one, and which in his hands renders the gradation of the same character as where the oxalate is employed. The density in this case is given by an enlargement of the volume by silver chloride, silver cyanide, and mercury cyanide, the original particle of silver remaining, The result of these two processes is to cause an image which appears black by reflected and also by transmitted light. There are, of course, other methods of treating the image to form a black deposit. Thus sulphite of soda will give it, but it leaves behind only half the silver particle, and in place of the remaining half this annexes to itself a particle of metallic mercury. This is according to Mr. Chapman Jones's careful experiments. Now the question arises whether there is any necessity to have a black image. Mr. Debenham has advocated the use of Schlippe's salts to form a scarlet image, and it undoubtedly has a good effect for it adds to the size of the particles. If we had transparent particles, say, like glass, scattered over the plate to form the image, undoubtedly the image would print less dense than it would do if we converted the colorless particles into a non-actinic color, but if they are opaque to begin with a change of color is not necessary. When we have treated half a gelatine negative with mercuric chloride, and compare this half with the neighboring half, we are at once struck when holding it up to the light how greatly the density appears to be increased. If we examine it carefully we shall find that the light transmitted is by no means white. It is a yellowish color, and very unlike the light reflected from the surface. The question arises as to whether it is necessary to carry operations any further, and whether a density of image has not been secured which is sufficient without any after treatment. Quite recently experiments have been made by the writer in this direction, and with results which no doubt would have been arrived at long ago had it not been for the groove one gets in. A plate was exposed for different periods to a standard light on different portions of a plate, and divided into four; one part was left unintensified, another part was intensified with mercury alone, a third was treated with oxalate, and the fourth with cyanide of silver. All four were then placed in a printing frame, and platinum paper exposed to the light coming through them. After the prints were developed they were compared one with another, and the following were found to be the order of greatest density:

1.—Mercury and silver cyanide.
2.—Mercury alone.
3.—Mercury followed by ferrous oxalate.
4.—Unintensified portion.

This is what might have been expected had all the deposits been black, for the mercury and silver cyanide intensification would give the greatest volume to the particles, the mercury alone the next largest, and the mercury and silver, produced by the ferrous oxalate, the smallest.

To throw more light upon the matter, the densities of all four portions were measured, with the result that the order of density was:

1.—Mercury and silver cyanide.
2.—Mercury followed by ferrous oxalate.
3.—Unintensified portion.
4.—Mercury alone at the densest parts, though equal to 3 at the least dense portions.

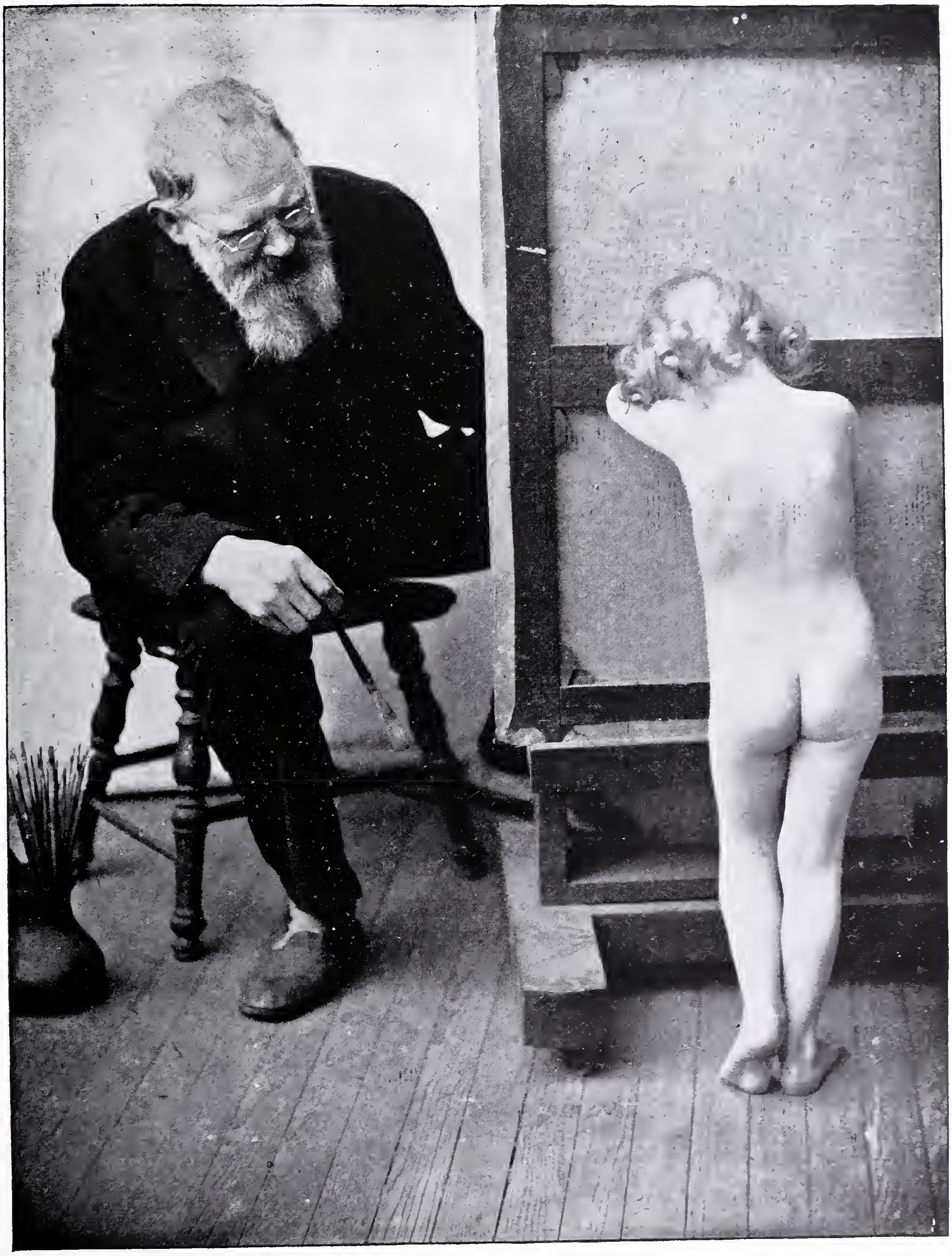
The results show that the measured densities would be incorrectly shown by the prints.

It has been stated above that "black" density was measured by the surface of the bare glass on a given area. It must be recollected that when the mercury is applied it is more than probable that the particles of silver are split up, or rather shattered into *very* much smaller particles, and that as white light endeavors to penetrate them, the light is scattered from one to another, and only finally emerges robbed of a good many rays, and those rays would be the violet and blue rays, for very fine particles scatter them most. Moreover, though a substance may be apparently transparent, yet it may cut off the whole of the visible ultra-violet rays and also some of the violet. An interesting experiment to make is to throw a spectrum on the screen, and place in the ultra-violet a piece of paper smeared with ordinary machine oil, or with a solution of quinine. Either of these will make visible the ultra-violet parts of the spectrum. If we now take a fused slab of chloride of silver, which to the eye appears perfectly colorless, and place it in the path of the beam which is used to make the spectrum, the ultra-violet spectrum will totally disappear, showing that it is cut off. Now, as part of the intensified particles is formed of silver chloride, it is evident that at all events these rays would be cut off, even if there were no scattering. As already said, the chloride of mercury and silver deposit appears yellow by transmitted light, and it may be due to the two causes combined, but most probably it is chiefly due to the first cause. Be that as it may, the fact remains that an image which has been intensified with mercury alone gives a density which is much better than would be expected. Another curious, but not unexpected, result is also to be found in negatives which have been treated with mercury, and subsequently by other substances which do not give a permanent black. Such changed negatives, though they may be yellow in parts, will be found in all which the writer has tried to give prints in which there are no markings visible due to the change in color. The writer has by him an old collodion negative which was intensified by mercury and sulphide of ammonium. It is now a bright yellow, but it prints as well as it did when it was jet black.

Experiments were also made to ascertain whether the simple mercury-intensified negative changed color in the light. There is no doubt that the surface tends to bleach slightly, but, so far as could be ascertained, the printing density remained unchanged. The chloride of mercury is not the only mercury salt which can be employed. The bromide and iodide also give very similar results. The subject is by no means fully investigated at the present time, and leaves ample room for further experiment.

* * *

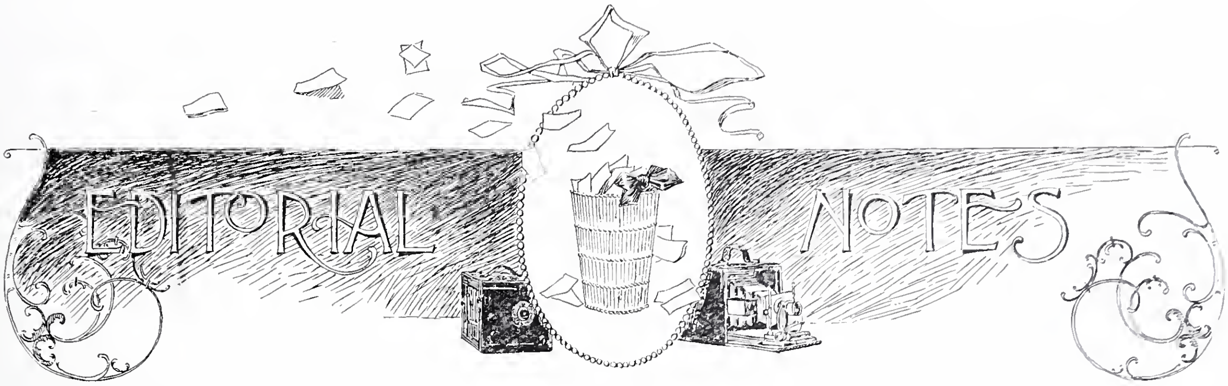
AFTER PAUL PEEL.



PHOTOGRAPHED FROM LIFE.

COPYRIGHT, 1894, BY NAPOLEON SARONY.

THE POUTING MODEL.
FROM "SARONY'S LIVING PICTURES."



EDITORIAL NOTES

THE undoubted success of the first issue of our monthly magazine has been most gratifying to all concerned in its production. We think the present issue will not be found inferior in interest or artistic merit; and we hope with the assistance of our subscribers to keep every number up to the present standard.

* * *

We have a few copies of the January number left, and those wishing to subscribe or secure the January issue must do so at once, otherwise they may get left behind.

* * *

Professor Laudy, of Columbia College, recently delivered an interesting lecture before the members of the American Institute upon the subject of "Phosphorescence and Fluorescence." He showed some effects obtained by means of Balmain's luminous powder and paint. This has been stated to be a mixture of 100 parts by weight of carbonate and phosphate of calcium obtained by calcining sea shells (those of the genus Tridacra are said to be the most suitable), and 100 parts of pure lime and 25 parts of calcined sea salt, both measured by weight. Half the amount of the whole weight of sulphur is then incorporated by sublimation and from 5 to 8 per cent. of mona-sulphide of calcium or barium added. Referring to our note book we find another recipe given, we believe, some time ago by a correspondent to *Photography*. Clean, thick oyster shells are heated until red hot. When cool they are roughly broken up and all the black and dark pieces removed. The remainder is then pounded up to fine powder. A layer of about half an inch of this is put into a fireclay crucible and then a layer of flour of sulphur about the same depth, and then another layer of oyster shell ashes, then sulphur again, and so on, repeating the process until the crucible is filled to about 2 inches from the top. This space is filled with well-worked clay, which is allowed to dry in a warm spot. When dry the crucible and its contents are placed in a fire and heated to a low blood red for at least an hour. Two hours of the clay heating has been properly done. It should be cooled slowly and the contents pounded to a powder. A phosphorescent powder is the result. If all this is too much trouble we may as well say that the powder ready-made can be obtained from Messrs. Devoe & Co., of New York, this being the substance used by Professor Laudy in his lecture.

* * *

In our last number we mentioned a pretty and interesting effect that could be obtained by exposing behind a positive transparency a piece of cardboard coated over with a luminous paint, which can be made from the powder by the addition of gum senegal dissolved in water. By such a proceeding we obtain a positive image luminous in a darkened room. The effect is, of course, but transient, and as soon as the prepared card loses its luminous properties it requires to be again exposed to a strong light beneath a transparent image. A far better method is to employ the old dusting-on, or powder process. This, as our readers are no doubt aware, consists in preparing a support with an organic tacky substance sensitized with dichromate of potash. Woodbury's formula was as follows:

Gum arabic	60 grains
Glucose	45 grains
Glycerine	10 minims
Potassium dichromate	30 grains
Distilled water	2 ounces

This substance is made up and filtered. A thin coating is laid on to a support, warmed, and exposed under a negative. After removal from the printing frame it is placed in a moist atmosphere for a short time. Result: those parts which have not been exposed became sticky, and if the luminous powder be dusted over, it will adhere in inverse proportion to the amount of light action. We thus have a permanent image which can be rendered visible in the dark at any time by merely exposing to the electric light or to a piece of ignited magnesium ribbon.

* * *

A process of sensitizing canvas, silk, paper, and other substances, has been devised by Juck, of Berlin. Bromide and iodide of silver are formed, in a solution containing just sufficient gelatine to support the silver salts. This is maintained at a temperature of 28 deg. Cent for an hour or so, to obtain greater sensitiveness. Washing in a centrifugal machine removes the alkaline nitrate and the silver haloids are then mixed up with a cold solution of arrowroot, which has been boiled in water until perfectly clear. The fabric, or paper, to be sensitized, is next coated, by means of a sponge, in the dark-room, and dried. If the emulsion has not been washed it is soaked in water for an hour or so and dried before exposure. Development is the same as with an ordinary gelatine bromide emulsion paper. The advantage of this process is that prints made by it lend themselves far more readily to finishing in crayons, oils, or water colors, than when the film is a gelatine one, which is not only likely to peel off, but has no "bite" for the colors, or crayons. The idea is not by any means new.

* * *

Messrs. Voigtländer & Son, the well known lens makers, have constructed a lens upon a new principle. It is a symmetrical doublet, each combination being a cemented triplet, and is termed the Collinear. It is corrected for three colors, the secondary spectrum being eliminated. It gives an angle of 90 deg., and works with but little falling off of light at the edges. Lenses have already been constructed with working apertures of *f*/7·5 and *f*/6·3.

* * *

We have received quite a number of complaints recently about plates and developers. From the descriptions that our correspondents send of the results they obtain, we are inclined to think that in almost every case the failure to obtain good negatives is due to the developer being used at too low a temperature. The water obtainable during this cold weather is but a few degrees above freezing point, and if used in this state weak negatives with every appearance of under-exposure will be the result. Further it will be found that, even if development be prolonged to an extent sufficient to produce a dense image, a very heavy loss will still take place in the fixing process, and a thin negative the result. The remedy is, of course, to heat the developer to from 75 degrees to 80 degrees Fahr., and keep it at as even a temperature as possible.

* * *

M. Henry Hermagis, writing in a French contemporary, deals with the permanency of silver prints. He is of opinion that the chief cause lies in the porosity of the paper and its permeability to moisture. The front of the paper being protected by the albumen film, he recommends that the back be likewise protected by a coating of shellac varnish or with mat surface papers; both sides should be so treated. The most suitable varnish he thinks to be one made by dissolving lac in a solution of borax or carbonate of soda.

If all this trouble is to be taken to secure permanent results, why not employ a permanent printing process in the first instance—carbon process for instance. Varnishing mat surface papers would be likely to remove the very effect that they are intended to produce. A very good method of making a silver print that will be likely to remain permanent, is to employ a printing-out paper of any description (dipped in a gelatine solution) and squeegee the finished picture to a piece of glass. To this it will adhere firmly. By varnishing the back the print is thus entirely protected from all atmospheric influences.

* * *

The article by Prof. Nordenskiöld, on the subject of "Photographing Snow Crystals," will, we have little doubt, be read with interest, and will possibly induce some of our readers, fortunate enough to possess a suitable microscope, to try their hand at this fascinating branch of photography. Although the photographs reproduced are both interesting and wonderful, they cannot compare with the elaborate and wonderful designs given in the scientific text-books, but in the one case we are shown facts and the other fanciful results of imaginative artists.

* * *

Mesol is the name given to a new combined bath recommended by M. Mercier. It consists of

Chloride of gold	0.60 grammes
Anhydrous hyposulphite of soda	80 grammes
Chloride of sodium	20 grammes
Acetate of lead	20 grammes
Talc	10 grammes
Water	100 c.c.

Mercier finds that baths of this description, if rendered completely neutral, will retain their activity for a much greater length of time. In the formula given above the talc, a double silicate of aluminia and magnesia, renders the solution perfectly neutral.

* * *

One of those *fin de siècle* products, the lady reporter, gives, in a Brooklyn daily, an account of her experiences with a photographer. The latter individual makes the statement that he can take the homeliest woman alive and make a pretty picture out of her; whereupon the lady reporter, who, of course, numbered among this class, challenged the knight of the camera to prove his words. The process of improving is then described. The face is powdered, the eyes blackened, the nose penciled to a fashionable shape, the mouth reddened, a hole in the neck filled with powder, and various other details are given of the method employed by this artist. The result is told in the following lines which conclude the article: "I reached home, lame, powder bedecked, black penciled, and heart broken, but four days later received three dozen photographs of what appeared to me to be a strange woman, but one I have worshiped and admired ever since for the beauty and grace depicted in these photos of which I have one or two in the most conspicuous place in every room in my little home."

* * *

According to a writer in the New York *Times*, "flash-light photography" is now the craze among the "four hundred." It is stated that animals have a peculiar aversion to be photographed by flash-light. While "taking" a room on Fifth Avenue a few days ago, one of the most successful amateurs in the city had a narrow escape from being mangled by a large mastiff that lay unnoticed in a corner while he got his instrument in position. "When the flash went off, the dog sprang at the camera, barely missing the operator. Dog and camera rolled on the floor. When the dense smoke cleared away, the camera was in small sections, the focusing-cloth was torn to pieces; but, strange to say, the exposed plate suffered no injury, and when developed showed the dog in the act of making ready for a spring." Very strange.

"Another amateur a few days ago was called upon to photograph three little puppies, with their mother, snugly ensconced in the corner of a sofa. The flash was explosive and instantaneous, and the effect was electrical. The mother dog went through a plate-glass window, while the puppies scattered in different directions and whined as if in great distress."

"A cat went crazy after being photographed by flash-light in a private art studio up-town a few weeks ago, and had to be killed."

* * *

There are some superstitions that apparently will never die. Once again that white-haired legend relative to the photographing on the eye of a murdered person the image of the murderer is brought forward. A woman was murdered recently at Jamestown, N. Y., and according to reports the eyes were subjected to the scrutiny of the microscope and camera, with the result that the image was seen of a big burly man, wearing a long overcoat, with the knees of his pants badly wrinkled. Later reports cast a doubt upon the truth of the story, and now we are told that there is no truth in it, a fact we were thoroughly convinced of before. The retina of the eye has no more power to retain the image, after such has passed from the field of vision, than the focusing screen of the camera. Experiments were made some time ago in this direction. Various animals were made to gaze at striking objects, and their spinal cords severed, so as to produce instantaneous death. The eyes and retinas were then photographed, but no trace of an image is said to have been discovered.

* * *

Even if the retina really possessed the power of retaining some impression of the last image thrown upon it, it would be very doubtful if it would be possible to make any useful photographs of it. Many attempts have been made to photograph the retina of the eye, but as yet with little success. The light reflected from the fundus oculi, or base of the eye, is of a dark red color, and consequently has but little effect upon the sensitive plate, as every photographer will readily understand. Opticians are of course looking for a good orthochromatic plate, rendered specially sensitive to red. Dr. Howe, of Buffalo, has already made some attempts with the isochromatic plates already procurable, but such have not been very successful.

EQUATIONS OF THE CONJUGATE FOCI, THEIR DERIVATIVES AND THEIR USES.

BY WILLIAM M. MURRAY.*

Some years ago J. A. C. Branfill, an English authority, deduced a series of useful equations from the general expression for the conjugate foci, which has been published in the "Almanac of the British Journal of Photography," ever since 1882, and in "The Photographic Times Almanac" (America) since 1887. Notwithstanding his lucid directions for their employment in practical photography these equations do not seem to have come into general use among amateurs, and it occurs to me that many are deterred from considering them as possible aids in their work by the apparently mysterious alternate values given for each focus, there being no fewer than four expressions for each conjugate. It must be confessed that photographers, as a rule, do not look kindly on mathematical calculations of any kind. To them all equations are algebra, and the suggestion that these formulæ may be used by any one possessing a knowledge of vulgar fractions is apt to be answered by a shrug of the shoulders and a thou-art-not-yet-fifty-years-old-and-dost-thou-teach-us? expression. Indeed, some of our would-be artistic brethren seem to believe that the study of scientific symbols may trammel their genius for making good pictures, forgetting that art *plus* science must ever be greater than art *minus* science. With a view to facilitate the understanding of these equations I here present the details of their derivation—which Mr. Branfill no doubt considered too simple a matter for explanation,—and, for the benefit of my fellow members in The Society of Amateur Photographers especially, I have also prepared a demonstration of the general equation for a single bi-convex lens—following the admirable elucidation of Dr. C. E. Woodman (Photographic Times, Volume XVII., part 1, and "Photographic Times Almanac," 1887)—conforming the algebraic symbols to Branfill's equations. To these I have added an explanation of the subject of depth of focus by the calculation of a formula for the distance beyond which all objects are in approximate sharpness. The whole of the following discussion of the equations of the conjugate foci presupposes a lens without appreciable thickness, and the formulæ are estimated for small direct pencils from points of the object on the axis, deviated through the lens, to foci on the axis; no account whatever being taken of spherical aberration or curvature of field. While not absolutely correct from the standpoint of the manufacturing optician they are sufficiently accurate to serve all the needs of the average amateur photographer—who generally uses lenses of the smaller sizes,—for whom, indeed, the more complicated formulæ, expressed in terms of the radii of the curves, the index of refraction, and the thickness of the lens, would be so unwieldy as to be practically useless.

Let us first consider the general equation for conjugate foci, from which all the others are derived.

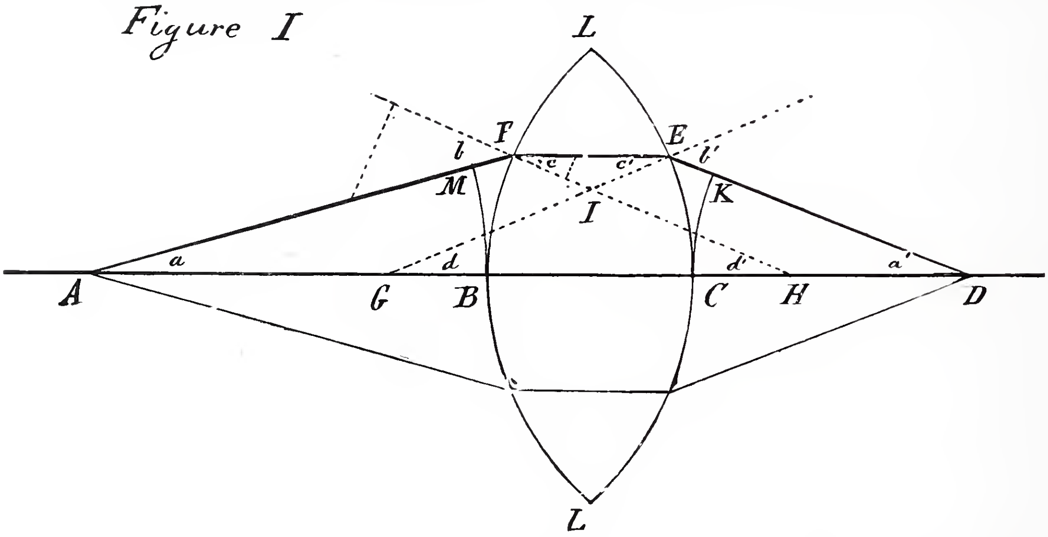


Figure I

Figure 1 represents a double-convex lens, LL, having radii GC and BH. AF is a ray of light from a point of an object on the axis, refracted through the lens from F to E and coming to a focus at D, also on the axis. GE and FH are two normals meeting the ray at the points of incidence and emergence F and E. The angle b, made by the incident ray with the normal FH at F, is called the angle of incidence, and the angle b', made by the emerging ray with the normal GE at E, is called the angle of emergence. The angles c and c', made by the line of direction of the ray through the lens with the normals, are termed the angles of refraction. The figure is exaggerated in its proportions to show these angles clearly; in reality the line AF proceeds from a point so distant as to make the ray almost parallel to the axis, and the size of the lens is insignificant in comparison with the distance AB.

Now because the angle b is the exterior angle of the triangle AFH, and the angle b' is the exterior angle of the triangle GED,

$$b = a + d', \text{ and } b' = d + a',$$

and $$b + b' = a + a' + d + d' \quad (1)$$

Light is theoretically supposed to move in waves, the fronts of which advance at right angles to its direction. Let GB, Figure II., represent a portion of the wave front of the ray AF, Figure I., so small as to be practically a plane, meeting obliquely the surface of the lens along the line BF, Figure II.—which for the purposes of this discussion may also be regarded as a plane—and deviated through the lens along the lines FQ and BD. Calling the angle GBF, which the wave front makes with the surface of the lens and which is equal to the angle made by the direction of the ray with the normal, the angle of incidence b; and the angle BFD, which the wave front makes with the lens surface after refraction, equal to the angle made by the deviation of the ray with the normal, the angle of refraction c, we have

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* Read before the Society of Amateurs of New York. We are indebted to Mr. R. A. B. Dayton, President of the Society, for loan of the cuts illustrating this paper.

$$\text{Sin b} = \frac{GF}{BF}, \text{ and Sin c} = \frac{BD}{BF}$$

dividing the first by the second,

$$\frac{\text{Sin b}}{\text{Sin c}} = \frac{GF}{BD}$$

But it is evident that while the point G, of the wave front, is advancing from G to F that the point B advances in the new medium to D according to the ratio of the velocity of light in the two media. Designating the respective velocities of light in the first and second media by V and V' we may write

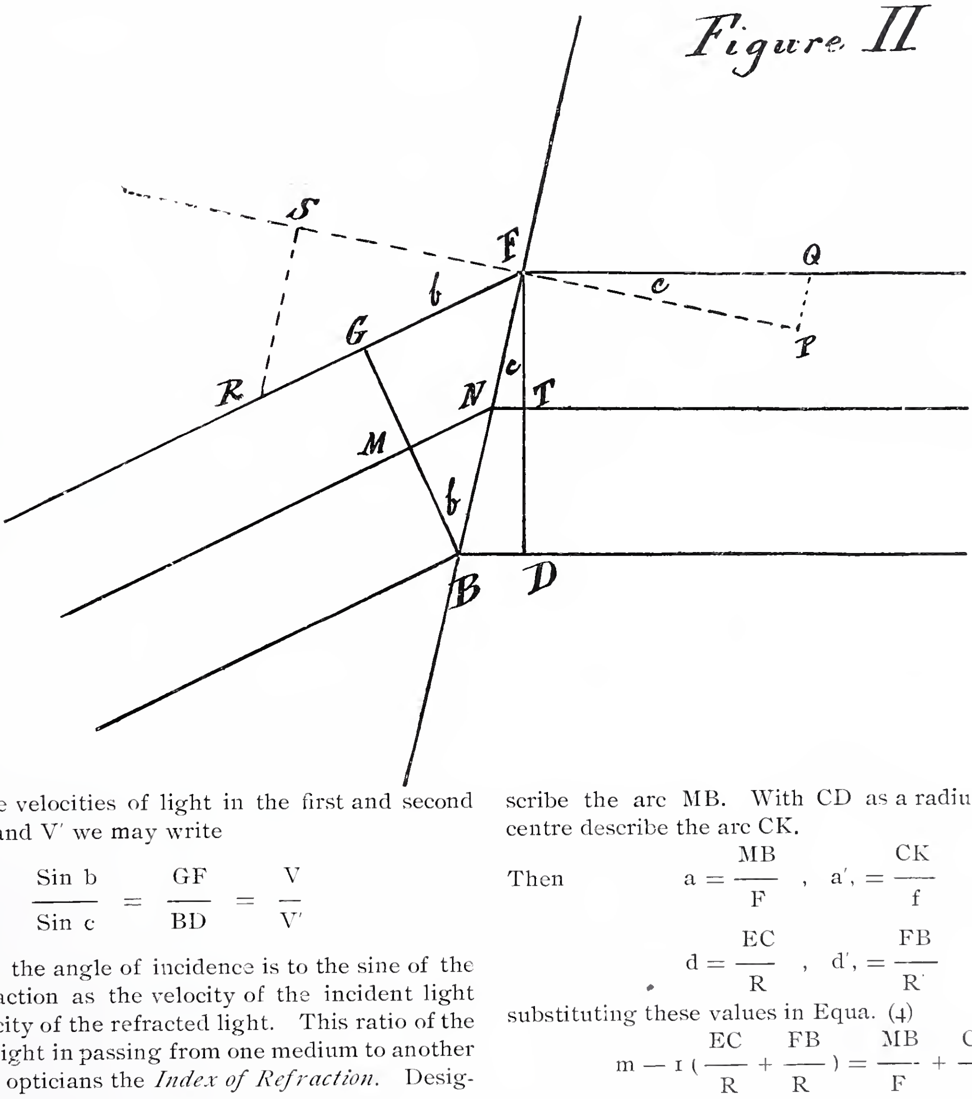


Figure II

$$\frac{\text{Sin b}}{\text{Sin c}} = \frac{GF}{BD} = \frac{V}{V'}$$

or the sine of the angle of incidence is to the sine of the angle of refraction as the velocity of the incident light is to the velocity of the refracted light. This ratio of the velocities of light in passing from one medium to another is termed by opticians the *Index of Refraction*. Designating this index (or $\frac{V}{V'}$) by m, we have

$$\frac{\text{Sin b}}{\text{Sin c}} = m$$

similarly we may prove, from Figure 1, that

$$\frac{\text{Sin b}'}{\text{Sin c}'} = m$$

Substituting the angles for their sines, as being virtually proportional,

$$b = m\,c \qquad \text{and } b' = m.c'$$

adding $$b + b' = m\,(c + c') \qquad (2).$$

But the triangles FIE and GIH, Figure 1, having a common angle at I, therefore

$c + c' = d + d'$, substituting in Equa. (2)

$$b + b' = m\,(d + d') \qquad (3)$$

combining (3) and (1)

$$m\,(d + d') - d - d' = a + a'$$

or $$m - 1\,(d + d') = a + a' \qquad (4)$$

Designate the radius GC by R; the radius HB by R'; the conjugate focus AB by F; and the conjugate CD by f. Then with AB as a radius and A as a centre describe the arc MB. With CD as a radius and D as a centre describe the arc CK.

Then $$a = \frac{MB}{F}, \quad a', = \frac{CK}{f}$$

$$d = \frac{EC}{R}, \quad d', = \frac{FB}{R'}$$

substituting these values in Equa. (4)

$$m - 1\left(\frac{EC}{R} + \frac{FB}{R}\right) = \frac{MB}{F} + \frac{CK}{f} \qquad (5)$$

But, as we have said before, the lens is so comparatively small that we may regard the arcs MB and FB, CK and EC, as virtually coinciding in straight lines, as equal to each other, and—from the construction of Equa. (5)—as equal to unity.

Therefore (5) becomes

$$m - 1\left(\frac{1}{R} + \frac{1}{R'}\right) = \frac{1}{F} + \frac{1}{f} \qquad (6)$$

This is the general formula for bi-convex lenses, expressed in terms of the conjugate foci, the radii of the curves, and the index of refraction. If the point A (Figure I) is at an infinite distance from the lens, then $\frac{1}{F}$ becomes $\frac{1}{\infty} = 0$, and f becomes the focus for parallel rays or the principal focus. Designating the principal focus by p, Equa. (6) becomes

$$m - 1 \left(\frac{1}{R} + \frac{1}{R'}\right) = \frac{1}{p} \qquad (7)$$

comparing Equations (6) and (7)

$$\frac{1}{F} + \frac{1}{f} = \frac{1}{p} \qquad (8)$$

This is the well known general formula for conjugate foci, embodying the familiar law that *the sum of the reciprocals of the two conjugate foci is equal to the reciprocal of the principal focus.*

The refractive index of air to glass is known by experiment to be in the ratio of 3 to 2,

or $m = \frac{3}{2}$, substituting in Equa. (7)

and reducing the first member to a common denominator.

$$\frac{R + R'}{2RR'} = \frac{1}{p}$$

whence,

$$p = \frac{2\,RR'}{R + R'} \qquad (9)$$

Being the general equation for focus of a glass bi-convex lens. If the radii are equal $R' = R$, and

$$p = \frac{2\,R^2}{2\,R} = R \qquad (10)$$

Therefore *the principal focus of a bi-convex lens of equal curves is equal to its radius.*

Branfill's Equations Relating to the Conjugate Foci, and Their Uses.

The utility of Branfill's expressions results from the incorporation of the ratio of the size of the object to that of the image into the several values of the foci as obtained from the general equation.

Let us resume the general equation—

$$\frac{1}{F} + \frac{1}{f} = \frac{1}{P} \qquad (1)$$

$$Fp + fp = Ff$$

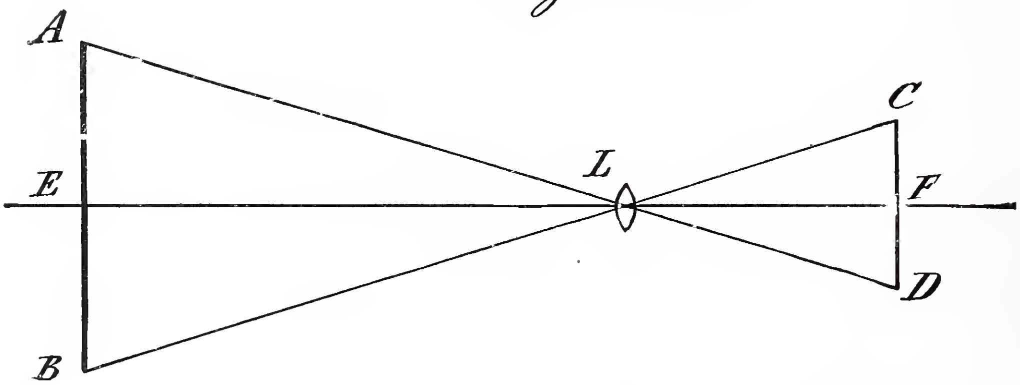
and

$$p = \frac{Ff}{F + f} \qquad (2)$$

$$F = \frac{f\,p}{f - p} \qquad (3)$$

$$f = \frac{F\,p}{F - p} \qquad (4)$$

Figure III



Referring to Figure III., we have the extreme rays of light AD and BC from the object AB proceeding in straight lines through the lens L and, coming to a focus at F, producing the image CD. Therefore, by similar triangles, we have the proportion,

AB : CD : : LE : LF

or O : I : : F : f

$\frac{O}{I} = \frac{F}{f}$, and designating this ratio of the size of the object to that of the image by r, we have

$$r = \frac{F}{f} \qquad (5)$$

$$F = rf \qquad (6)$$

$$f = \frac{F}{r} \qquad (7)$$

Combining (3) and (6) $r = \frac{p}{f - p}$ (8)

Combining (4) and (5) $r = \frac{F - p}{p}$ (9)

Combining (2) and (6) $p = \frac{rf}{r + 1}$ (10)

Combining (10) and (6) $p = \frac{F}{r + 1}$ (11)

From (11) $F = p\,(r + 1)$ (12)

From (12) and (6) $f = \frac{p\,(r + 1)}{r}$ (13)

From (12) and (13) $F + f = \frac{p\,(r + 1)^2}{r}$ (14)

From (14) $$p = \frac{r(F+f)}{(r+1)^2} \qquad (15)$$

From (10) and (15) $$f = \frac{F+f}{r+1} \qquad (16)$$

From (16) and (7) $$F = \frac{r(F+f)}{r+1} \qquad (17)$$

From (16) $$F + f = f(r+1) \qquad (18)$$

Expanding and reducing (14) $$F + f = p\left(r+2+\frac{1}{r}\right) \qquad (19)$$

Branfill's Equations of the Conjugate Foci.

Compiling our results we have the following equations:

$$p = \frac{r(F+f)}{(r+1)^2} = \frac{F}{r+1} = \frac{rf}{r+1} = \frac{Ff}{F+f}$$

$$F = p(r+1) = \frac{r(F+f)}{r+1} = rf = \frac{fp}{f-p}$$

$$f = \frac{p(r+1)}{r} = \frac{F+f}{r+1} = \frac{F}{r} = \frac{Fp}{F-p}$$

$$F+f = \frac{p(r+1)^2}{r} = f(r+1) = p\left(r+2+\frac{1}{r}\right)$$

$$r = \frac{F-p}{p} = \frac{p}{f-p} = \frac{F}{f}$$

Applications.

The posterior conjugate f being the most inconvenient to measure, those values into which it enters as a factor are the least useful in practice as well as the most liable to errors. This is not the case, however, when it is added to the anterior conjugate as in the first expression for the principal focus.

$$p = \frac{r(F+f)}{(r+1)^2}$$ is the easiest formula for finding a focus of a lens. We have only to compare the similar dimensions of the object and the image, which gives the value of r, and measure the distance from the object to the ground-glass, which gives the value of F + f, to substitute the values in the equation and we have the focus. For example, suppose we focus on any near object so that its image, when sharp, is one-quarter the size of the object (similar dimensions, of course, not the area but the square root of the area), then r = 4.

Let us say that the distance F + f is 43¾ inches, then

$$p = \frac{4\,(43.75)}{25} = 7''$$

Therefore $F = 7 \times 5 = 35''$
or the distance from the object to the optical centre of the lens is 35 inches,

$$f = \frac{7 \times 5}{4} = 8\tfrac{3}{4}'',$$ or the distance from the lens to the ground-glass is 8¾ inches.

$$F + f = \frac{7 \times 25}{4} = 43\tfrac{3}{4}''$$

and

$$r = \frac{35-7}{7} = 4 \text{ times.}$$

And these results may be verified *ad libitum* by any of the other expressions.

To Find Focus of Lantern Objective.

$$p = \frac{F}{r+1}$$ is a convenient formula for ascertaining the proper focus of a lantern objective to give a certain size of image in a hall of known dimensions. Several years ago it was proposed to place our lantern in the back of the meeting room at a distance of 60 feet from the screen. The screen being 105 inches wide the magnification of a 3'' picture would be 35 times and $r = 35$

$$p = \frac{F}{r+1} = \frac{720''}{36} = 20''$$ and the lens required would be of 20 inches focus.

To Find Length of Copying Board.

If we desire to construct a copying apparatus to perform certain reductions or enlargements, having a lens of known focus, and wish to have the dimensions as compact as possible, we may use the expression for F + f to find the length of the copying board. Last winter the Society provided a reducing camera for our members who had hand-camera negatives with converging or tipsy verticals requiring correction. As we wished to economize space it was necessary to calculate the length of copying board, using a 4 inch lens, to reduce 5 x 7 and 4 x 5 negatives to lantern size.

Allowing 3 three times as the greatest possible reduction r = 3 and p = 4

$$F + f = \frac{p(r+1)^2}{r} = \frac{4 \times 16}{3} = 21\tfrac{1}{3} \text{ inches.}$$

A board 24 inches long would therefore be amply large enough to do all the work required, on which, indeed, we might reduce 8 x 10 negatives to lantern size.

To Find Size of Image.

The expression $r = \frac{F-p}{p}$ enables us to ascertain the sizes of images of objects at varying distances from the camera. It is useful, for example, in operating the hand camera, to know what size a man would appear on the ground-glass at, say, 10 feet, 20 feet, and 40 feet distance, the lens being of 7'' focus.

At 10 feet $$r = \frac{F-p}{p} = \frac{120''-7}{7} = 16 \text{ times.}$$

20 feet $$\frac{240-7}{7} = 33 \text{ times.}$$

40 feet $$\frac{480-7}{7} = 68 \text{ times.}$$

As the average height of a man may be taken as about 5½ feet, or 66 inches, his image—

At 10 feet would be $$\frac{66''}{16} = 4 \text{ inches.}$$

$$\text{At 20 feet,} \quad \frac{66}{33} = 2 \text{ inches.}$$

$$\text{At 40 feet,} \quad \frac{66}{68} = 1 \text{ inch nearly.}$$

TO FIND SPEED OF SHUTTER TO PHOTOGRAPH MOTION.

The value of r may also be used to calculate, approximately, the speed of a shutter required to photograph an object moving across the field of the lens at a certain rate. An athlete running 100 yards in 10 seconds, would move 360 inches in 1 second. At 40 feet distance, with a lens of 7 inches,

$$r = \frac{F-p}{p} = \frac{480-7}{7} = 68 \text{ times.}$$

$\frac{1}{100}$ inch is regarded generally as the greatest allowable amount of blur consistent with apparent sharpness, and we may say that $\frac{1}{100}$ inch on the ground glass represents $\frac{68}{100}''$ traveled over at 40 feet distance.

Then—

$$360'' : \frac{68''}{100} :: 1 \text{ sec.} : \frac{1''}{530}$$

So it would require a shutter speed of about $\frac{1}{500}$ sec. to sharply picture a sprinter forty feet away moving at right angles to the lens, and even this makes no allowance for his legs moving more rapidly than his body. Of course, when he is moving toward, or away from, the camera, a slower shutter will suffice.

TO FOCUS HAND CAMERAS.

Two of the expressions of value for r may also be utilized in the focusing of hand cameras. For example,

$$r = \frac{F-p}{p} \text{ and } r = \frac{p}{f-p}$$

$$\text{Therefore,} \quad \frac{F-p}{p} = \frac{p}{f-p}$$

Having focused the image of a distant object sharply and marked the position of the ground-glass on the bed of the camera, it is evident that the distance between the optical centre of the lens and the mark is the principal focus. For any nearer objects we must rack out the ground-glass an additional distance equal to f—p. Calling this additional distance y we have from the last equation

$$f-p = y = \frac{p^2}{F-p}$$

and for distances over 20 feet we may disregard p in the denominator as being very small in comparison with F. Then

$$y = \frac{p^2}{F}$$

With a 7 inch lens in our hand camera, therefore, we must add to our focal length, for objects 20 feet away, the distance

$$y = \frac{49}{240} = 204 \text{ inch}$$

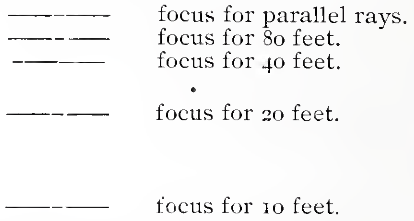
and for 40 feet, the distance

$$y = \frac{49}{480} = .102 \text{ inch.}$$

and for 80 feet, the distance

$$y = \frac{49}{960} = .051 \text{ inch.}$$

Thus we see that if we mark the position of the ground-glass for the principal focus and then the position for a short distance as 10 feet, the mark for the focus of objects at 20 feet will be found half way between them; and for 40 feet half way between that for 20 feet and the principal focus, and so on, thus,



There is so little error in this calculation, notwithstanding the omission of p in the denominator of the formula, that it may be regarded as approximately correct, especially for the small lenses used in hand cameras. For the shorter distances as 10 feet, or less, it is advisable to focus directly on the object before making the mark.

Besides the equations we have just been discussing Mr. Branfill gives an expression by which we can find the Uniform System number for any lens and stop, to enable us to compare its speed with a standard lens—a portrait combination—the diaphragm of which is one quarter the focal length.

$$\text{The Uniform System No.} = \frac{p^2}{16\,a^2}, \quad a$$

being the actual size of the aperture of the lens. A glance at the expression shows that it reduces to unity when $\frac{p}{a} = 4$. And if we have a lens whose diaphragms are not marked according to the Uniform System we may obtain their comparative rapidities by substituting the proper values in the expression $\frac{p^2}{16\,a^2}$.

Branfill's final equation is to find the time of exposure for any given lens, stop and ratio of reduction or enlargement. Designating the exposure by x,

$$x = \frac{f^2}{16\,a^2} = \frac{p^2}{16\,a^2} \cdot \frac{(r+1)^2}{r^2}$$

that is if x = 1 when $\frac{p}{a} = 4$.

As we are not likely to make our test exposures on a portrait lens (of $\frac{p}{4}$ rapidity) this equation in its present form is not convenient to use. But if we substitute for 16 (the square of the intensity ratio 4 of the portrait lens), the square of the intensity ratio of any other lens we wish to use as a standard we shall be able to calculate readily any required exposure. Thus, if we find a certain view with a lens 7 inch focus and stop $\frac{7}{8}$ inch in diameter requires 1 second,

$$\text{as} \quad \frac{p^2}{64\,a^2} = \frac{(7)^2}{64\,(\frac{7}{8})^2} = 1 \text{ second}$$

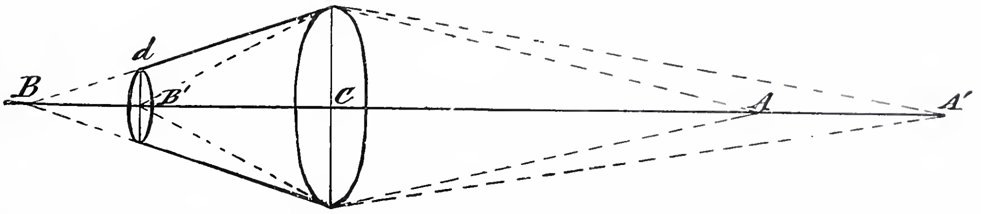
a lens 12 inch focus with stop 1 inch in diameter requires $2\frac{1}{4}$ seconds, because

$$\frac{p^2}{64\,a^2} = \frac{144}{64} = 2\tfrac{1}{4} \text{ seconds}$$

If instead of a distant view we copy an object at short range we use the equation in its more complete form and substitute the value of r, or f. Thus, if the lens 7 inch focus and stop $\frac{7}{8}$ inch required 1 second on the open view as above, it would require $1\frac{1}{2}$ seconds if used to copy an object one-quarter its original size, the strength of light being the same,—

for
$$x = \frac{f^2}{64\,a^2} = \frac{p^2}{64\,a^2} \cdot \frac{(r+1)^2}{r^2}$$
$$= \frac{(7)^2}{64\,(\frac{7}{8})^2} \cdot \frac{(4+1)^2}{(4)^2} = 1.56 \text{ seconds.}$$

Figure IV



Having our lens stops once marked according to the Uniform System we may, however, dispense with the use of these last equations, as we may make any particular stop the unit of exposure to suit the sensitiveness of the plate employed. The system of using graduated diaphragms to regulate exposures, as adopted by the Photographic Society of Great Britain, was devised on the principle that it is convenient to have a series of stops, each one requiring twice the exposure of the one preceding it, the largest aperture being that of the portrait lens, working at $\frac{p}{4}$ which is the unit of the system. As the light admitted through a lens varies as the area of the circular aperture or diaphragm, and as the areas of circles are to each other as the squares of their diameters, and as the diameters of diaphragms may be, and are, expressed in fractions of the focal length, therefore we may construct the following table of exposures:

Ratio of focus to diaphragm $\frac{p}{n}$ or $-\frac{p}{n}$	Exposure ratios: being the square of stop ratios.	U. S. exposure numbers.	Exposure for plates sensitometer 16 as Carbutt B.	Exposure for plates sens. 27. as Carbutt Eclipse, or Cramer Crown, or Seed 26 x.
		2d column in lower terms.		
4	16	1	$\frac{1}{8}$ sec.	$\frac{1}{128}$
5.6	32	2	$\frac{1}{4}$ sec.	$\frac{1}{64}$
8.	64	4	$\frac{1}{2}$ sec.	$\frac{1}{32}$
11.3	128	8	1 sec.	$\frac{1}{16}$
16.	256	16	2 sec.	$\frac{1}{8}$
22.6	512	32	4 sec.	$\frac{1}{4}$
32	1024	64	8 sec.	$\frac{1}{2}$
45.2	2048	128	16 sec.	1 sec.
64	4096	256	32 sec.	2 sec.

It will be seen by the fourth column that $\frac{p}{11.3}$ with 1 second is taken as the unit of the exposures for the ordinary landscape plate of medium sensitiveness (Warnerke 16), and by the fifth column $\frac{p}{45.2}$ with 1 second as the unit for the very fast plates (Warnerke 27); both estimated for open and well lighted views, including say a far distance, a middle distance, and a foreground with some foliage.

TO FIND DISTANCE BEYOND WHICH ALL OBJECTS ARE IN FOCUS.

Strictly speaking there is no such tting as a lens with depth of focus. In Figure IV. we see that an object at A on the axis of the lens has its focus at B, and an object at A' has its focus at B', and so for any other point—every value of F having its corresponding value of f according to the general law of conjugate foci. But where the objects are very distant, the rays from them being practically parallel, they will have their images sharp at the focus for parallel rays or the principal focus.

$$y = f - p = \frac{p^2}{F} \quad , \quad F = \infty \text{ for objects at infinite distance, and}$$

$$y = f - p = \frac{p^2}{\infty} = 0.$$ So by reason of distance there is a point beyond which all objects will be practically sharp.

Similarly when we cause the rays from nearer objects to become nearly parallel by employing small diaphragms we bring this point nearer to the lens. By comparing the equations of the conjugate foci with the equations expressing the relations of the diaphragms we may arrive at a formula for the place of this point. What we understand by depth of focus, then, depends entirely on the diaphragms and not in any way on the the constitution of the lens itself.

In the Figure IV. we have a lens having its optical cencre at C. A is a point on the axis having its focus at B, and A' another point having its focus at B. AC is therefore the greater conjugate focus or F. for the first object and A' C = F' the greater conjugate focus for the second object. Then CB = f and CB = f.

Let diameter of lens opening be designated by *a*. Then rays proceed through lens diaphragm at C in a cone having at B' the diameter expressed by *d*. From similar triangles

$$d : a :: BB' : BC$$

or,
$$\frac{d}{a} = \frac{f - f}{f} \qquad (1)$$

According to the general equation for conjugate foci for an object at A we have

$$\frac{1}{F}+\frac{1}{f}=\frac{1}{p}$$

and, for an object at A′

$$\frac{1}{F'}+\frac{1}{f'}=\frac{1}{p}$$

Therefore,
$$\frac{1}{F}+\frac{1}{f}=\frac{1}{F'}+\frac{1}{f'}$$

$$F'f'f+F'Ff'=Ff'f+F'Ff$$

$$F'f'f-Ff'f=F'Ff-F'Ff'$$

$$f'f(F'-F)=F'F(f-f')$$

$$\frac{f-f'}{f}=\frac{f'(F'-F)}{F'F} \qquad (2)$$

combining (2) and (1)

$$\frac{d}{a}=\frac{f'(F'-F)}{F'F}$$

$$d=\frac{af'}{F}\frac{(F'-F)}{F'}=\frac{af'}{F}\cdot\frac{\left(1-\frac{F}{F'}\right)}{F'} \qquad (3)$$

if A′ is infinitely distant $F'=\infty$

$$f'=p$$

and

$$\frac{1-\frac{F}{F'}}{F'}=0$$

Equation (3) then becomes $d=\frac{a\,p}{F}$ (4)

Expressing *a* in terms of the focus,

$a=\frac{p}{n}$, *n* being the number of times diameter of diaphragm is contained in the focus,

Equation (4) becomes $d=\frac{p^2}{n.F}$ (5)

and $F=\frac{p^2}{n\,d}$ (6)

Regarding diameter of the greatest allowable circle of confusion as $\frac{1}{100}$ inch $d=\frac{1}{100}$

and $F=\frac{100\,p^2}{n}$

Designating by D such a value of F as would give no larger circle of confusion than $\frac{1}{100}$″ — at which distance everything would be practically sharp—and dividing the co-efficient of p^2 by 12, so as to have our answers in feet, we have,

$$D=\frac{8.3\,p^2}{n} \qquad (7)$$

Substituting in (7) the values for p and n we may calculate the distance beyond which everything is in focus for any lens and stop. Supposing our lens to be a rapid rectilinear of 7 inches focus furnished with diaphragms according to the Uniform System we have

$$\begin{aligned}
D &= \frac{8.3\times 49}{8} &&= 50.8 \text{ feet for stop } \frac{p}{8}\\
&= \frac{8.3\times 49}{11.3} &&= 36 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{11.3}\\
&= \frac{8.3\times 49}{16} &&= 25.4 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{16}\\
&= \frac{8.3\times 49}{22.6} &&= 18 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{22.6}\\
&= \frac{8.3\times 49}{32} &&= 12.7 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{32}\\
&= \frac{8.3\times 49}{45.2} &&= 9 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{45.2}\\
&= \frac{8.3\times 49}{64} &&= 6.3 \quad\text{″}\quad\text{″}\quad\text{″}\quad \frac{p}{64}
\end{aligned}$$

We may therefore leave our ground-glass at the adjustment for principal focus and, by putting in the foregoing series of stops, secure such depths of focus—so called—that with the smallest stop $\frac{p}{64}$ everything over 6½ feet distant will be in apparent sharpness.

DISCUSSION OF SUBJECT OF DEFINITION.

Referring again to Equation (5)

$d=\frac{p^2}{n.F}$ we see that the diameter of the circle of confusion varies directly as the square of the focus and inversely as the distance of the object and the ratio of the focus to the diaphragm. For constant values of F, or when the object remains at the same distance, the circle of confusion varies as $\frac{p^2}{n}$

Consequently the definition varies as $\frac{n}{p^2}$

If we require definition, therefore, without at the same time sacrificing rapidity, a small lens is preferable. For if we compare two lenses, one 12″ and the other 6″ focus,

both furnished with stop $\frac{p}{8}$, or exactly the same rapidity, we have for their respective definition,

Def. of 12″ lens $=\frac{n}{p^2}=\frac{8}{144}=\frac{1}{18}$

Def. of 6″ lens $=\frac{n}{p^2}=\frac{8}{36}=\frac{4}{18}$

Thus for the same speed the smaller lens has four times the definition. Therefore, *if we double the focus, keeping the same rapidity, we lose four times the definition.*

Let us give the 12″ lens such a stop as will give the same definition as the 6″ lens,

Def. of 6″ lens $=\frac{8}{36}=\frac{2}{9}$

Def. of 12″ lens $=\frac{32}{144}=\frac{2}{9}$

and we see that the smaller lens for the same definition has sixteen times the speed. Therefore, *if we double the focus, keeping the same definition, we lose sixteen times the rapidity.*

If we use the same size of diaphragm in both lenses, say ¾ inch which is $\frac{p}{8}$ for the 6″ lens and $\frac{p}{16}$ for the 12″ lens we have,

$$\text{Def. of 12″ lens} = \frac{16}{144} = \frac{1}{9}$$

$$\text{Def. of 6″ lens} = \frac{8}{36} = \frac{2}{9}$$

Here we find the larger lens has only half the definition, while $\frac{p}{16}$ is only ¼ the speed of $\frac{p}{8}$. Therefore, *if we double the focus, keeping the diaphragm the same actual size, we lose one-half the definition and four times the rapidity.*

And, *if we keep the focal length the same and double the actual diameter of the stop* (which gives four times the speed) *we only lose half the definition.*

For,

$$\text{Def. of 6″ lens with p/8} = \frac{8}{36} = \frac{2}{9}$$

$$\text{Def. of same lens with p/4} = \frac{4}{36} = \frac{1}{9}$$

If, on the other hand, we could be satisfied with the smaller lens having half the definition of the larger one we might increase the speed sixty-four times, for,

$$\text{Def. of 12″ lens with p/32} = \frac{32}{144} = \frac{2}{9}$$

$$\text{Def. of 6″ lens with p/4} = \frac{4}{36} = \frac{1}{9}$$

Therefore, *if we diminish the definition one-half, using a lens of one-half the focus, we gain sixty-four times the rapidity.*

TO FINISH DIAPHRAGM TO GIVE ANY REQUIRED DEPTH OF FOCUS.

Returning to Equation (3)

$$d = \frac{af' (F' - F)}{F \,.\, F'}$$

and making $a = \frac{p}{n}$ as before and substituting the value of f′ from Branfill's Equation,

$$f' = \frac{pF'}{F' - p} \qquad \text{we have}$$

$$d = \frac{p^2 (F' - F)}{n\,F\,(F' - p)}$$

and

$$n = \frac{p^2 (F' - F)}{d\,F\,(F' - p)}$$

We now have a value for n (or the ratio of focus to diameter of diaphragm) to give any required diameter of circle of confusion (d) to images of objects at various distances apart (F′—F).

Thus we may ascertain what stop to use to have objects, situated respectively 25 feet and 60 feet from a lens 6″ focus, both sharp or apparently sharp at the same time. Making $d = \frac{1}{100}$″ as before, we have,

$$n = \frac{100\,p^2 (F' - F)}{F\,(F' - p)} = \frac{100\,(6)^2 (720 - 300)}{300\,(720 - 6)}$$

$$n = 7 +$$

When, therefore, we have focused on an object sharply at 60 feet distance from a 6″ lens, we may, by the use of a stop one-seventh of the focal length or say p/8 of the Uniform System series, bring an object 25 feet distant into approximate focus.

CONCLUSION.

We may thus from the simple equation of the relations of the conjugate foci, determine the principal focus of a lens; the distance of the object; the position of the ground-glass; the size of the object and its image; the speed of a shutter to do certain work; focus our hand cameras; and discuss the subjects of rapidity, definition and depth of focus. While we believe that the easiest way to use these equations is to study the subject from the beginning it is only necessary to take the formulæ as we find them, ready made, in the tables to hold the key which will unlock many of the problems daily met with in the practice of photography. For instance, the simplest of Branfill's Equations—

$$p = \frac{r\,(F + f)}{(r + 1)^2}, \quad F = p\,(r + 1), \quad f = \frac{p\,(r + 1)}{r},$$

$$r = \frac{F - p}{p},$$

and the useful expression for depth of focus,—

$D = \frac{8.3\,p^2}{n}$, giving answer in feet, will be found most serviceable. The frequent substitution of known quantities in these to determine the unknown will fix them in memory and they will prove trusty friends. Above all let the first use of a new lens be the occasion of ascertaining its focus, employing, if need be, Branfill's first expression,—

$$p = \frac{r\,(F + f)}{(r + 1)^2}.$$

It may be urged that this equation, representing the focus of a lens without thickness, is liable to cause error. It supposes that the surfaces of the lens and its optical centre coincide. But this is not strictly true, and rays of light which from their direction would pass through the optical centre (transversals) are converged on entering and before leaving the lens on two other nodal points on the axis between the physical centre and the surfaces. These points are called the centres of admission and emission, and also Gauss points, because Gauss explained the subject at a meeting of scientists at Gottingen in 1840. As we ought to estimate p and f from the posterior Gauss point—centre of emission—and F from the object to the anterior Gauss point—centre of admission—it will be seen that any system that estimates the focus by dividing F + f (the distance from the object to the ground-glass) when object and image are the same size, by 4—

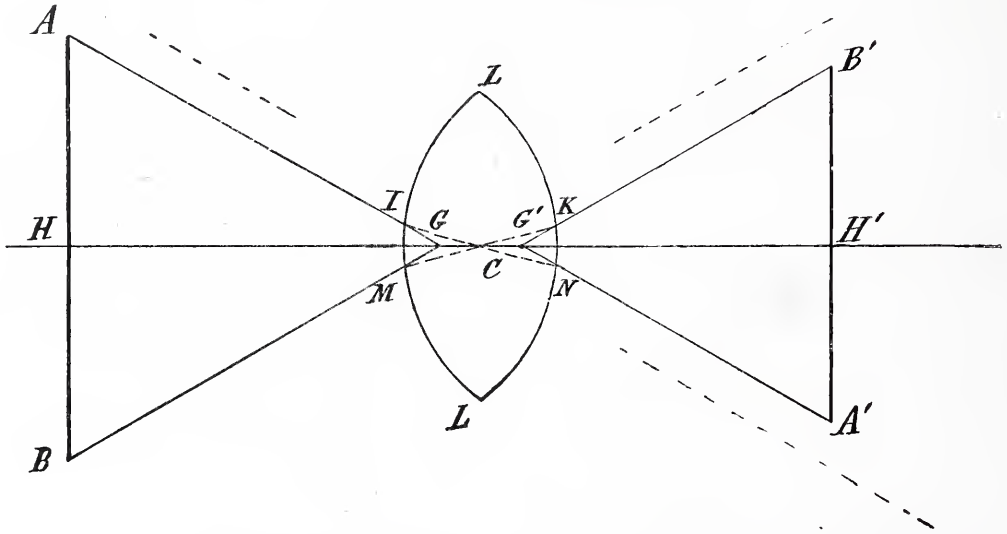
$$r = 1 \quad , \; p = \frac{r\,(F + f)}{(r + 1)^2} = \frac{F + f}{4}$$

—will introduce, in the case of a very large lens, some proportion of error. It has been claimed that at the United States Coast Survey Bureau at Washington (in 1866), in attempting to focus by calculation to copy maps to one-eighth scale—no greater error being permissible. than .0039 inch—using a large globe lens of nearly 20 inches focus, an error of ½ inch was made in the estimation of the principal focus and 2.91 inches in the distance from the object to the image from this cause. It was found, therefore, absolutely necessary to determine the focal centres or centres of admission and emission. How, then, shall we establish these centres from which to measure our foci? The following method has been recommended. Focus accurately on a very distant object and mark the position of the ground-glass on the bed of the camera. Then focus sharply on a near object so that the image is of the same size,

$$\left(f = \frac{p\,(r + 1)}{r}, \quad r = 1, \text{ therefore } f = 2\,p\right).$$

Having marked the second position of the ground-glass, the difference between the two marks will be the focus of the lens. Now measure twice this focus (2 p) from the ground-glass toward the lens and mark the place on the lens tube. It will be the centre of emission or posterior Gauss point, and in a rapid symmetrical will be found between the diaphragm or physical centre of the combination and back lens. Thereafter f should be measured from that point. The anterior Gauss point may be ascertained by measuring back from the object to the lens a similar distance and making a mark on the lens tube, and will be, in a symmetrical combination, between the physical centre and the front lens. With this method of ascertaining and measuring the foci the Coast Survey copying, mentioned above, was done by calculation with perfect accuracy and the ground-glass trial focusing was entirely dispensed with, to the great saving of the eye-sight of the operators in the Bureau. That this subject may be more clearly understood, I have drawn a diagram, Figure V., the proportions being exaggerated to show the principle. A transversal is a ray of light proceeding from a point on an object and passing through the optical centre of the lens. By a fundamental optical law it emerges from the lens after refraction in a path parallel to its original direction. In Figure V. the transversal AI proceeds from the extremity A of the object AB, is refracted through the optical centre C of the lens in the line ICN, emerges from the lens in the line NA′ parallel to its incident direction and finds its focus in the point A′ of the image. The prolongations of the incident ray to G, and of the emergent ray to G′, on the axis, mark respectively the anterior and posterior Gauss points from which the greater and lesser conjugate and the principal foci should be estimated. For it is evident that all the other points of the object AB send forth similar rays whose directions converge in a cone whose apex is at G, and, after being refracted through the optical centre, diverge to form the image B′A′ in a cone whose apex is at G′.

Figure V



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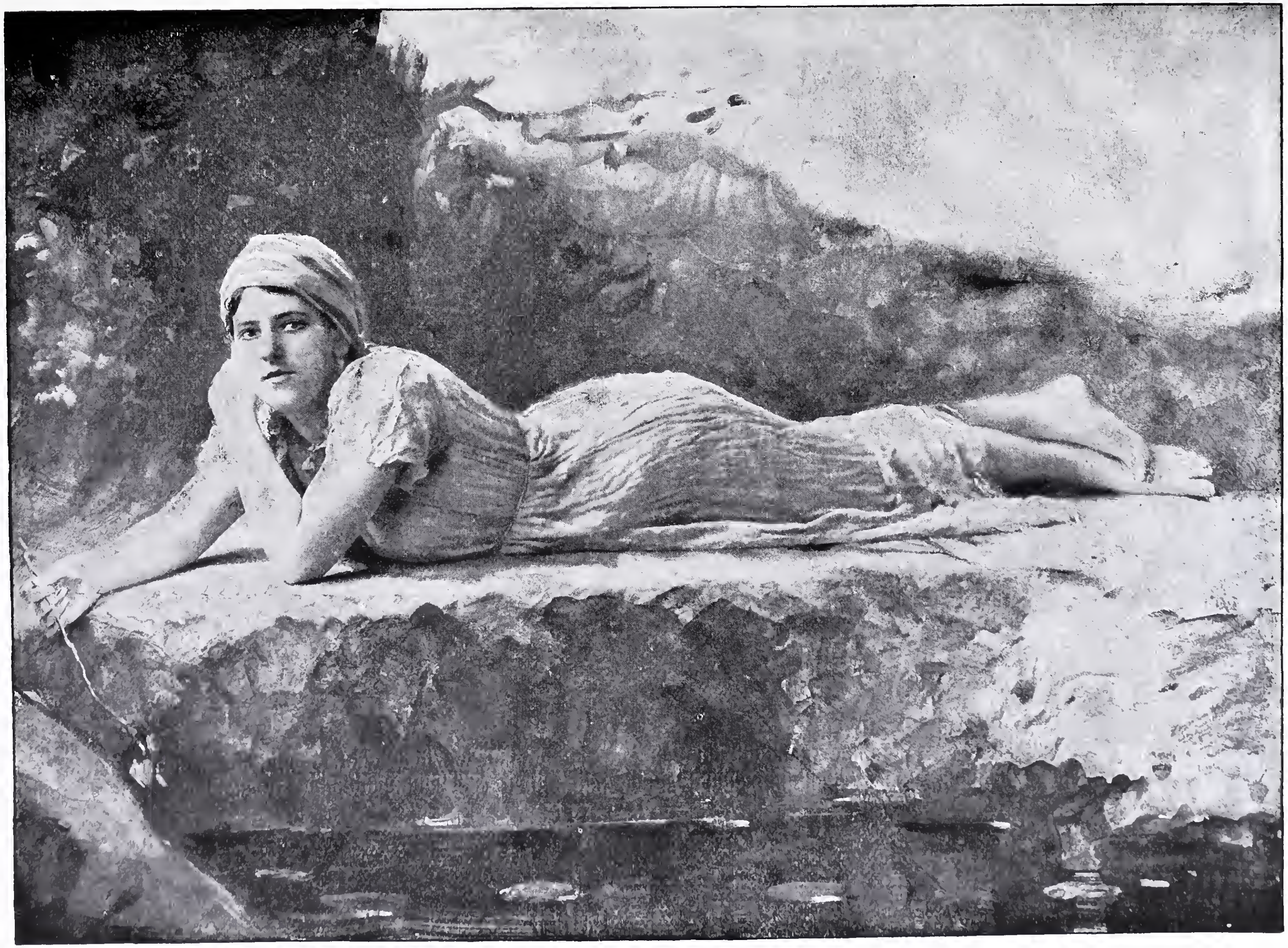
AFTER COMERRE-PATON.



PHOTOGRAPHED FROM LIFE.

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RUSTIC SIMPLICITY.

FROM "SARONY'S LIVING PICTURES."

NOTES.

A New Photographic Magazine has been published in Japan.

Voigtlander has introduced a new lens termed the Collinear.

W. B. Post has secured another medal at the South London Exhibition.

"The Pharmaceutical Era" will hereafter be issued weekly instead of semi-monthly.

The Eastbourne (England) Photographic Society will hold an exhibition in April next.

Walter Sprague is busy compiling a new edition of "The Blue Book," for photographers.

Photographing Snow Scenes.—For this purpose slow, thickly coated plates are the best.

The Omaha Camera Club is a live society, and its officers are efficient, and hard workers.

The Photochrome Engraving Co. are turning out in some very fine half-tone work in colors.

"Appollo" is the title of a new monthly photographic magazine published in Dresden.

Richard Keene and R. L. Kidd, two men prominent in the ranks of English photographers, died recently.

The Joint Exhibition Agreement between the New York, Boston and Philadelphia Societies has terminated.

F. E. Ives gave an interesting lecture on Triple Heliochromy before the members of the Society of Amateur Photographers of New York.

A Huge Telescope.—It is stated that Sir Howard Grubb is engaged in the construction of a reflecting telescope 10½ feet in diameter.

Cornelius Van Brunt delivered an entertaining lecture on "Flower Photography" before the members of the Brooklyn Institute of Science.

George G. Rockwood will give a lantern lecture, entitled "Photography Up to Date," at the Art Building in Brooklyn, on January 29th.

N. B. Andersen, a photographer of Redwood Falls, Minn., has invented a new photo dryer which is stated to be very simple and of great value to the photographer.

R. Eickemeyer, Jr., was awarded the gold medal of the champion class at the Hackney (England) Exhibition, and a bronze medal at the Leytonstone (England) Exhihibition.

The Royal Photographic Society.—Since the Society obtained the privilege of using its new name the number of applications for membership has become surprising.

Messrs. Queen & Co. have constructed an ingenious lantern slide camera by which both the English, American and French size slides can be instantly centreed with respect to the opening.

10,000 Zeiss Lenses.—The firm of Carl Zeiss, of Jena, have just completed the manufacture of their 10,000th lens, and this in only four years, the length of time they have been established.

"The Art Interchange" is a magazine that should be read by all lovers of art and artistic home decoration. With each issue are given away several beautiful colored pictures alone worth the price of the magazine.

A. Moreno, the well-known photographer, gave a demonstration of portrait making by the electric arc light, before the members of the Society of Amateur Photographers of New York.

"The Astrophysical Journal" will be the title of a new magazine shortly to be published by the University of Chicago. *Astronomy and Astrophysics* has been purchased and will be incorporated in the new magazine.

Mrs. S. Francis Clarke has been awarded first prize ($100) in the London *Graphic* photographic competition. Over fifteen thousand pictures were received. The selected ones will appear in special supplements issued by that magazine.

Our Seascape Competition.—The results of this competition will be announced in our March issue, and the prize pictures will be reproduced. The judges are Mr. Alfred Stieglitz and Mr. Carlton T. Chapman, the distinguished artist, who has earned a world-wide reputation for his superb marine pictures.

Ernest Edwards lectured before the members of the Society of Amateur Photographers. In an able manner he described the various photo-mechanical printing processes now in use and illustrated many of his remarks by specially prepared slides.

The American Amateur Photographer publishes a Christmas number containing many good things. The poor quality of the printing, however, has unfortunately ruined the majority of the beautiful pictures which have evidently been selected with care by the editor.

Notice to Subscribers.—The subscription price of this magazine having been reduced, those subscribers who have paid at the old rates will receive the magazine for an additional length of time corresponding to the amount paid and the balance at the end of the year.

The Brady Collection.—The celebrated Brady collection of photographs is to be sold by auction under a deed of trust. This collection includes prints from most of the negatives made by M. B. Brady, the famous Washington photographer, during the last forty or fifty years, most of them between 1850 and 1875. The entire number of prints is somewhere between 5,000 and 6,000.

Professor Chandler's lecture upon "Photo-mechanical Printing Processes," delivered before the members of the Society of Amateur Photographers of New York, was a great success. The lecture was rendered doubly interesting by the exhibition of the Professor's immense stock of photo-mechanical prints and various articles showing the different stages of the more important processes.

A Burglar Who Knew the Law.—Two or three men recently arrested for burglary in Brooklyn, were taken to be photographed for the Thieves' Gallery. One of them, however, objected and appealed to Justice Walsh on the ground that police authorities had no right to compel a prisoner to sit for his picture unless he had been regularly tried and convicted. Justice Walsh was forced to admit that such was the case and the photograph was not made.

A New Terror for the Police is the hand camera, it having been pressed into the service of the League for the Enforcement of Law in Brooklyn. At a recent meeting of this society a number of snap shots were projected upon the screen showing uniformed policemen standing idly in front of the doors of beer saloons while children were entering by the side doors or coming out with filled pitchers. In many cases the number of the unconscious policeman is as faithfully recorded.

The Photographic Society of Philadelphia.—This Society has arranged for a series of three illustrated lectures to be held in the Association Hall, Philadelphia. The first will take place January 15th, and be by Mr. W. N. Jennings, subject: "The Yellowstone Park." Some of Ives' "Natural Color" slides will be shown. On Tuesday, January 22d, Dr. Benjamin Sharp will lecture on "The Tropics and Hawaiian Islands," and on Tuesday, January 29th, Mr. F. E. Ives will give "A Summer Vacation in Europe."

What to do with Spoiled Bromide Prints.—According to Surgeon-Major Van Geyzel, flat, dirty yellowish or greenish looking bromide prints can be rendered perfect by a method he has adopted. He first reduces the image slightly with ferridcyanide and then intensifies it by bleaching with mercuric chloride and redeveloping with rodinal. The result is an image of a fine blue-black color. The prints must, of course, be thoroughly washed between each operation. The method is rather a complicated one, and we would prefer to buy some better bromide paper and make new prints, especially as the possibilities of pictures treated in the manner described being permanent is doubtful.

On the Sensitiveness of Orthochromatic Plates.—By Dr. Bardet. (*Bulletin Sociale Francaise*, translated in the *Photographic Journal.*) Dr. Bardet describes his own practice in using such plates, and finds no difficulty, under favorable conditions, in obtaining a well exposed plate in $\frac{1}{40}$ seconds, even when using a pale yellow screen.

He uses an energetic developer, well diluted, and he carries the development as for as possible. He finds that instantaneous pictures obtained on orthochromatic plates are much softer in character, and the results are much improved when yellow screens are used.

He also calls attention to a communication made by Mr. Henry to the Academy of Science in regard to the increase of sensitiveness which gelatino-bromide plates acquire by keeping.

Converting Albumen Paper into Bromide.—The *Photograpische Archiv* points out the possibility of converting a sheet of sensitized albumen paper into a bromide developing paper by immersing for a few minutes in a solution of

Bichromate of Potassium	123 grains
Bromide of Potassium	61 grains
Water	12 ounces

It is then washed for about two hours and dried. By exposure to lamplight for from ten to twenty seconds an image can be developed. Amidol is stated to be the best for the purpose.

Unless the results are superior to bromide paper prints we fail to see the utility of the process, bromide paper being about one-half the price of sensitized albumen paper.

Lick Observatory,—In reply to a correspondent who asked: In a large observatory, such as the Lick, how are expenses met? *Popular Astronomy* replies as follows: "Of the $700,000 left by Mr. James Lick for the erection of the Lick Observatory, more than $575,000 was used in preparing the site, erecting the buildings, and securing the astronomical instruments for the observatory. So that of the large gift bestowed, less than $125,000 remained for the support of the observatory after its completion. The observatory belongs to the University of the State of California, and we understand that the State pays all running expenses, and has control of endowment funds through university officers. Professor Holden estimates the annual expenses of the observatory at $20,000."

The Disappearing Photograph.—The following are directions as given in the *Scientific American*:—"A sheet of ordinary white, unsized printing paper, or blotting paper, is to be immersed in a liquid made by dissolving twenty grains of gelatine in an ounce of water. When the paper is thoroughly saturated, it is to be hung up to dry. After thorough drying, it is to be floated for three or four minutes on a mixture of one part saturated solution of bichromate of potash, to two parts water, and again dried. The paper is now sensitive to light, and must be kept in a dark place. By exposure to the sun under a negative for a sufficient time, a brownish print is produced, which is first to be soaked in cold water, until the unaltered bichromate of potash is dissolved out, and then in warm water, which removes all the gelatine that has not been rendered insoluble by the combined action of bichromate of potash and light. On the completion of this operation, the picture is still visible, in a faint brown color, but, by immersion in a solution of sulphurous acid, this color is bleached out, and, on drying, the paper appears perfectly white all over, without the faintest trace of an image. In order, however, to bring out the image, all that is necessary is to immerse the paper in clean water, whereupon the picture plainly appears, in white on a dark ground. On drying, it disappears again, and the process may be repeated as often as desired."

The Newton Camera Club have held their Third Annual exhibition. Over 800 pictures were exhibited The awards were as follows:

Club competition (for members only)—Portraiture, first prize, Charles E. Lord; second, W. E. Peabody; third, F. W. Sprague, 2d; landscapes, first prize, E. Stockin; second, Charles E. Lord; third, F. W. Sprague, 2d; marines, first prize, H. F. Guild; second, F. W. Sprague, 2d; third, E. B. Hitchcock.

Open competition—Portraiture, first prize, Horace B. Pearson, of Boston; second, Charles E. Lord; third, W. E. Peabody; landscapes, first prize, E. Stockin; second, Charles E. Lord; third, H. L. Guild; marines, first prize, A. F. Gilbert; second, F. W. Sprague, 2d; third, Horace B. Pearson.

Hand camera work—First prize, A. F. Gilbert; second, W. H. S. Pearce; third, Dr. G. F. Grant.

Enlargements—First prize, E. E. Snyder; second, F. W. Sprague, 2d; honorable mention to Miss Emma J. Fitz, of Boston, for her remarkable genre studies.

The Second Annual Members' Exhibition of the Society of Amateur Photographers of New York will be held March 13th to 27th, inclusive.

Class A. Landscape and Marine.

Class B. Figure Subjects and Portraiture.

Class C. Architecture and Interiors.

Class D. Hand camera work.

Class E. Transparencies, including Lantern Slides in sets of six.

Class F. Scientific Subjects.

2. Entrance Fee. Frames occupying less than 4 square feet, will be 25 cents per frame, larger sizes, 50 cents each.

3. Rules. (1) Any picture made entirely by a member of this Society will be eligible for exhibition. (2) Pictures heretofore exhibited in New York City, or having won a prize, will not be admitted to competition. (3) Entry forms and all pictures must be in the hands of the Committee (all charges prepaid) not later than March 6th. (4) All communications and packages to the Exhibition Committee, at the rooms of the Society.

4. Awards. A silver medal will be given for the best picture in each class.

5. Special Award. President R. A. B. Dayton offers a gilt medal (to be known as the President's medal) for the best picture in the exhibition.

Exhibition Committee,
John H. Janeway, M.D.
W. E. Johnson.
F. M. Hale.

Preparation of Platinum Paper for Cold Development.—*The Photo Mittheilungen* gives the following formula:

The iron solution consists of

Ammonia oxalate of iron	50 grammes
Water	50 c.cm.
Solution oxalate acid, 1:10	15 c.cm.

The chloroplatinite of potassium is prepared in a solution 1:6. Mix:

Platinum solution	7.2 c cm.
Iron Solution	4.8 c.cm.
Per sheet.	12 c.cm.

This amount is spread by means of a brush on Rives paper in the usual manner. The paper is first sized with gelatine or gum water.

The foregoing gives, with sufficiently dense negatives, good, strong prints. If less depth is desired, the iron solution may be increased and the platinum solution diminished in the same proportion. For thin negatives add to the solution 0.1 to 0.8 of a solution of bichromate of ammonia. As an example of a preparation which will give from a thin negative a brilliant platinum print with pure whites and deep blacks, is given the following:

Platinum solution	8 c.cm.
Iron solution	4 c.cm.
Bichromate of Ammonia, 1:25	0.8 c.cm.

The addition of this amount of bichromate reduces the sensitiveness of the paper materially.

Photographic Action at Low Temperatures.—We have before brought before our readers the result of researches on this subject, says *The British Journal of Photography*, which went to prove that photographic action took place at temperatures which completely prevented all chemical action, a result which would have been ascertained by one of the disputants in the old quarrels as to whether the results of light action in a film were "chemical" or "mechanical"—a distinction which, at the present time, does not necessarily mean a difference. Professor Dewar, F.R.S., at a meeting of the Chemical Society, lately gave the results of his investigations in this direction. A number of photographs have been taken at temperatures of −180 degrees, using various sensitive plates and films, and these have been compared with similar photographs taken at the same time under similar conditions at the ordinary temperature. "The photographs have been examined by Captain Abney, who reports that the photographic action has been reduced by 80 per cent. at the temperature of –180 degrees. If the photographic action is brought about by a chemical change, then it appears to be the only one that can be traced under such conditions, as substances having the most powerful affinity have no action on each other, and all voltaic combinations cease to give a current at such low temperatures. It is certain that the Eastman film, cooled to –200 degrees by the evaporation of air *in vacuo*, is still fairly sensitive to photographic action. Much further work, however, will be required to reach a definite conclusion as to what is taking place when substances sensitive to photographic action are subjected to such conditions of temperature."

Photographing a Drop of Water During its Fall.—Since the offering of a prize by the *Revue Suisse*, the photography of falling drops has been pursued with great ardor by our best qualified amateurs, and along with many failures some very good results have been obtained, says the *Photo Mittheilungen*.

Such a falling drop moves with wonderful rapidity which is beyond the limits of our pet instantaneous shutters. Sharp pictures are only to be obtained through momentary illumination by means of a powerful electric discharge such as is employed in photographing projectiles. The illumination and catching of the drop offer considerable difficulty.

The following method may facilitate the work: Focus the camera sharply on the line of descent, and illuminate the drop from the side by means of a Geissler tube placed vertically.

The somewhat weak light may be concentrated on the line of descent by means of an ordinary condenser. The intermittent illumination will show the drop as a string of shining pearls, which will be brought out by means of a proper dark background.

The camera protected reflections may be allowed to stand uncapped and the drops will be photographed automatically in their various phases. It may be remarked that, in addition to the most rapid intermittent Geissler tube, it is necessary that the lens be of large aperture and great illuminating power and the plate be very sensitive. Properly modified the method may be applied to other purposes, as, for example, the recording of the flight of insects, etc.

The Yellowstone in Natural Colors.—The beauties of the Yellowstone Park were presented to an audience at the Franklin Institute, last evening, in a strikingly realistic manner by Messrs. William N. Jennings and Frederic E. Ives, who made a photographic journey to the region referred to several months ago. Mr. Jennings' narrative of the trip, says the *Philadelphia Public Ledger*, was a thoroughly enjoyable one, and he contributed to the illustrations of the lecture an admirable series of hand camera pictures of the wonderful scenery of the Yellowstone, besides a number of bright figure studies, which were much appreciated. His descriptions were original and vivid, and there was a thread of humor throughout which was as novel as it was enjoyable.

The feature of the occasion, however, was the fact that many of the views were photographs in sectional colors made by Mr. Ives by his own process of "composite heliochromy. The slides were projected personally by Mr. Ives, who employed an electric arc light for the purpose. The pictures possessed not only the form of the originals, but the marvelous variety of colors for which the Yellowstone region is famous. The views of the exquisite pools and line formations, and of the stupendous cañon of the Yellowstone were received with round after round of applause, the picture of the pool known as the "Morning Glory," being one of especial delicacy and perfection. The truth to nature of the pictures was well shown by a variety of familiar objects —such as a bunch of wild flowers, a plate of fruit, etc., with which every one is familiar, and testimony to the absolute correctness of the representations of the peculiar color effects in the Park was borne by a number of persons who were present. The lecture is to be repeated at Association Hall next month, under the auspices of the Photographic Society of Philadelphia.

An amusing story is told at the joint expense of an engaged couple; a prospective mother-in-law, and an instantaneous photographer. The affianced persons, says the *Daily Telegraph*, a young man from the provinces, and his fair cousin, who lives with her parents in Paris, went with the young lady's father and mother to the Montmartre Fair, the youthful provincial paying all the expenses of the visits to the menageries, waxworks and peep-shows. It suddenly occurred to him that it would be a good thing to have the family group photographed; so all repaired to the booth of an instantaneous artist, who, after he had fixed the sitters, undertook to send the proof to the abode of the father and mother when it was dry. The young man thereupon promised to call personally for the group, and he did so on the morrow, when a parcel carefully tied up was placed in his hands. He repaired with it to his prospective mother-in-law, who, on opening the packet, uttered a piercing shriek, which re-echoed through the house as well as the flat. Then she flung the parcel from her with loathing, and the young man picked it up. To his intense astonishment and horror, he found that, instead of the family group, the instantaneous operator had sent a photograph representing a donkey, an ox, and two cows. The young man from the provinces, deeming himself to be the victim of a derisive practical joke, lodged complaint with a commissary of police, who summoned the operator to his presence. The man was amazed at what he termed the result of a stupid mistake. He had been photographing cattle, owned by a farmer at Saint Denis, and he had mixed up the two *clichés*. The family group was sent to the farmer, and, as it could not be recovered for a few days, he offered to repair his error by taking a new likeness of the young man and his relatives. The prospective mother-in-law would not agree to this, and maintained, in spite of explanations and entreaties, that she had been grossly insulted. She furthermore declined to allow her daughter to marry the man who had foolishly led her into the photographer's booth; but she may rescind her Draconic decision after a day or two of calm deliberation.

THE · EDITORIAL · TABLE

Reviews of Books, Photographs, Apparatus, etc. Received

The Practical Photographer.—From the publishers of this up-to-date English monthly we have received a bound copy of Volume V., containing the issues of 1895. It is full of illustrations and articles of practical value.

"The British Journal Photographic Almanac" for 1895. Henry Greenwood & Co., London.

This healthy little annual grows fatter and fatter each year. The 1895 issue is not by any means inferior to its predecessors, either in get-up or literary merit. The article on "By-Paths of Stereoscopic Photography," by the editor, is alone worth the price asked for the whole work. All the best writers on photographic subjects contribute to its pages, most of the articles being of practical value. An epitome of progress occupies nearly one hundred pages, dealing with all the newest discoveries and inventions. The work is published by Messrs. Henry Greenwood & Co., of London, and is obtainable from the Scovill & Adams Co., 423 Broome Street, New York.

The Dark-Room and Its Equipment. By H. J. L. J. Massé. Messrs. P. Lund & Co., London, E. C.

"Nothing," says the author of this valuable little work, "gives one so much pleasure as to see well made laboratory fittings, and apparatus nicely finished and varnished and properly arranged, and in first-class order, but there are many who cannot afford to indulge in this lavish display and who would make use of substitutes if the latter only occurred to them." He, therefore, details a number of expedients for those with limited means, and who are desirous of making the most of what they can afford. The subject is well treated, and the book should be of good value to those contemplating the fitting up of a dark-room for photographic work.

"A Girl I Know." Photographic Illustrations. By Mrs. N. Gray Bartlett: Lines by Marian L. Wyatt, Boston. Joseph Knight Co.

We have already had occasion to call the attention of our readers to the very attractive books which Mrs. Bartlett has made with the aid of her camera. The present volume is, perhaps, the most attractive of all. It consists of twelve pages, each containing at least one photogravure from a negative by Mrs. Bartlett, and some pages, a number of illustrations, together with specially designed letter-press, which is in itself decorative, and helps to enhance the beauty of the book. The same young lady is, of course, used as a model for all the pictures, and it may be said that she is entirely worthy of Mrs. Bartlett's camera. The book is, moreover, handsomely bound with an illustration on the title page, and is sold in a neat card board box Price, $2.

"Sarony's Living Pictures." A. E. Chasmar & Co., 34 Union Square, New York.

Three numbers of this excellent publication have already appeared, and its success is assured by the fact that already three editions of the first issue have been demanded. Napoleon Sarony is, as everyone knows, both a clever artist and a good photographer, and these beautiful examples of reproductive art are, in most cases, the joint work of the camera and the crayon. Through the kindness of the publishers we are able to give our readers two examples of these pictures. The one entitled "Rustic Simplicity," after the painting by Comerre-Paton, is the joint work of the camera and crayon; but "The Pouting Model," after the picture by Paul Peel, is entirely the work of the camera. In the magazine under review these pictures are printed in two tints and are very effective. They are sold at the low price of 25 cts.

The Modern Practice of Retouching Negatives. Ninth edition. New York: The Scovill & Adams Co.

Another edition—the ninth—of this ever popular instruction book has been required, and one thousand more copies are issued to supply the demand. The book has proved one of the most popular numbers of the S. & A. Photographic Series, of which it is No. 7. For the benefit of those who have not yet seen the book we give the table of contents, which is as follows:

Chapter I.—Retouching—Its Use and Place.

Chapter II —Materials Necessary for Negative Retouching.

Chapter III.—Different Surfaces for Touching on Collodion Films.

Chapter IV.—How to Retouch.

Chapter V.—Copies.

Chapter VI.—Positives.

Chapter VII.—Enlargements.

Chapter VIII,—Landscapes.

Chapter IX.—Preparing the Gelatine Negative for Retouching.

Chapter X.—The Easel and Lighting.

Chapter XI.—Retouching Details.

Chapter XII.—Hints from the German Methods of Retouching.

Appendix,—Retouching Large Heads.

Retouching Gelatine Negatives with Red Chalk and Black Crayon.

Retouching the Negative by Chemical Means.

The price of the book remains the same: In paper covers, 50c.; cloth bound (Library edition), 75c., and will be sent postpaid on receipt of price, by the publishers, and can be obtained of any photographic dealer.

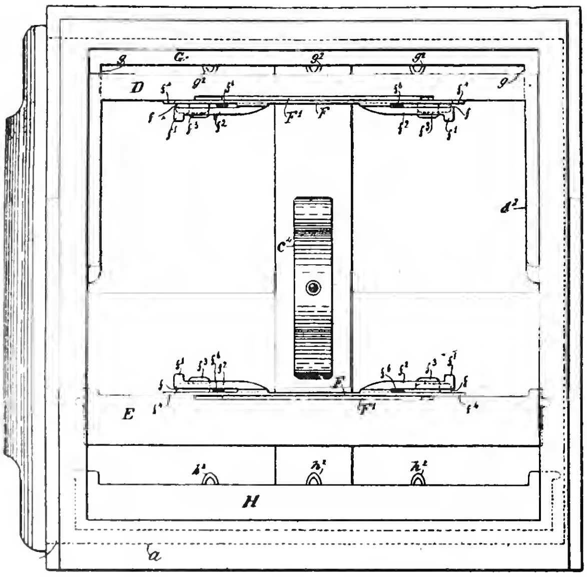
"**L'Elixir du R. P. Gaucher.**" By Alphonse Daudet. With illustrations from nature by A. H. Magron. Edited and published by Ch. Mendel, 118 Rue d'Assas, Paris.

As an example of the possibilities of photography for illustrative purposes, this is by far the best specimen we have seen. The illustrations to Daudet's amusing story are printed in with the text, by the photogravure process, and are skillful examples of genre work. Magron has been remarkably successful in his choice of models for the old monks, and from their attitude and expressions they have evidently grasped the spirit of the story.

PHOTOGRAPHIC PATENTS.

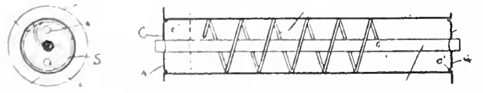
530,100. **Plate Holder.** Matthias Flammang, Newark, N. J., assignee to the Scovill & Adams Co. of Connecticut.

This invention relates to an improvement in plate holders the object of which is to provide a plate holder of simple construction and which may be employed for ordinary exposing, or exposing with what is known as a ray negative or line screen—a transparent plate having etched or engraved lines as used in the half-tone engraving process. The holder contains adjustable supports for the plate and for the ray negative or line screen, and further adjustable arrangements for regulating the distance between the two.



530,327. **Tension Spool for Roll-holders.** Theodore Minot Clark, Newton, Mass.

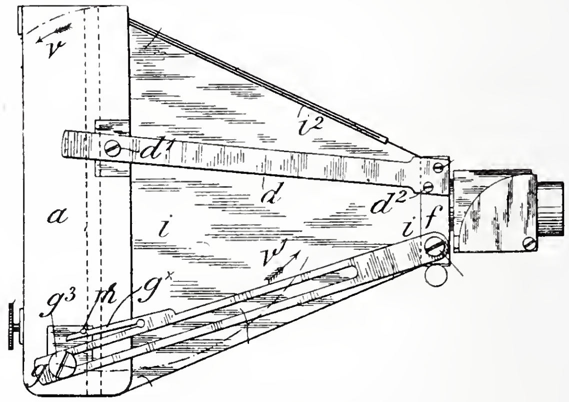
The object of this invention is to provide an improved construction of spool, bobbin, or reel, with provision for placing a tension on the commodity carried by it and maintaining a stretch of the same always taut by a tendency to rewind it. It is here adapted for holding the sensitive film commonly used in cameras; it keeps the film extended across the camera perfectly smooth, and at the same time no tension device bears against the film and it is not in any way impaired.



The device consists of a tension spool comprising a cylindrical shell having heads with circular holes through their centres, a spindle extending through the cylinder and fitting said holes, leaving the cylinder free to rotate on said spindle, and a spiral retracting spring fastened to said spindle and surrounding the same and extending longitudinally within the cylinder in frictional engagement with the walls thereof.

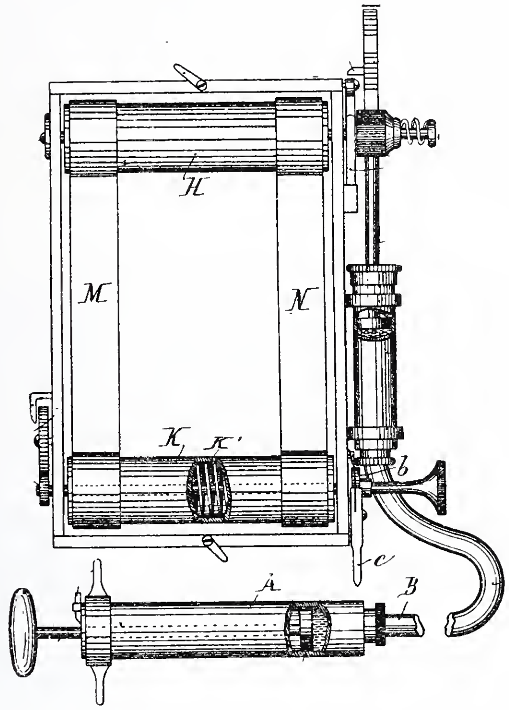
No. 531,416. **Folding Photographic Camera.** Henry Hill and Arthur L. Adams, London, England.

This invention relates to folding photographic cameras, and has for its object to so arrange and construct a camera that it may be set up for working by a single movement, and may, by a reversal of that movement, be folded into a small compass. What is claimed as new is a photographic camera, the combination of a front plate, backwardly extending arms rigidly pivoted thereto, a swinging frame provided with a guide pin also pivoted to said arms, one end of said frame being adapted to swing outwardly and the other end inwardly when the bellows is to be folded, a bellows connected to said front plate and frame and adapted to collapse in folds on one side and expand telescopically on the other side and vice versa when folding or unfolding the camera respectively, and a slotted bar connected at one end to said front plate and at its other end to said frame and adapted to work on said guide pin.



530,486. **Shutter Mechanism for Cameras.** Theodor Vilhelm Jensen, Copenhagen, Denmark.

This invention relates to instantaneous photography, and has for its object the providing of improved shutters operated by mechanism, simple and durable in construction and effective and instantaneous in operation. The principal claim is for a shutter operating mechanism for cameras, comprising two cylinders connected with each other by a flexible tube, the latter as well as the cylinders being filled with a liquid, pistons moving in the said cylinders, one being controlled by the operator and the other being provided on its piston rod with a rack, a gear wheel adapted to receive an intermittent rotary motion from the said rack, a drum adapted to be rotated by the said gear wheel in one direction, a second spring pressed drum connected with the first named drum, both being connected with the shutter proper, a pin held on the shaft of the first named drum and adapted to engage notches in the hub of the said gear wheel, and a spring pressed locking lever for the said pin and adapted to be actuated by a lug on the said rack, substantially as shown and described.

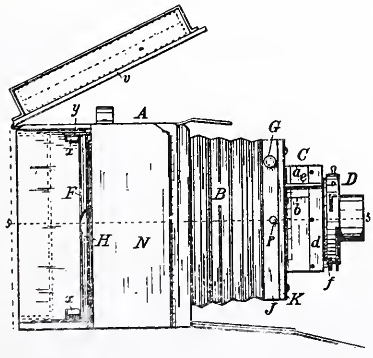


No. 530,955. Folding Camera. Gustave D. Milburn, Rochester, N. Y.

An invention relating to certain improvements in the construction of photographic cameras.

Claims are made for the following:

The combination, in a photographic camera, of the expansible bellows, the internal supporting arms, an adjustable slide, and a lens on the slide, arranged so that the camera is focused for distant objects when the bellows is fully distended and the slide fully drawn out, said slide being supported by the bellows and held thereto by friction and the bellows supported from its opposite end, whereby the bellows may be fully drawn out by the slide and the latter then independently extended, substantially as set forth.



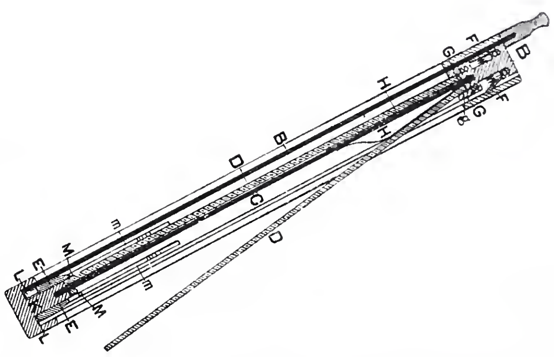
The combination with a photographic camera of the carrier E and a plate-holder attached to and movable with said carrier, the latter being hinged to the rear of the camera whereby it may be turned back to expose to unobstructed view the ground-glass, and a door N, substantially as set forth.

No. 530,965. Hypo=Eliminator. Albert Schmidt, Berlin, Germany.

This patent has been taken out for the use of persulphates as eliminators of the hyposulphite salt from the photographic film. After writing of the defects in the substances usually employed for this purpose the inventor says: "Now I have found that the salts of persulphuric acid are excellently adapted for rendering an excess of hyposulphite harmless by oxidation. After the photograph has been fixed the plate or paper is immersed in a dilute solution of persulphate of potassium, of ammonium, or of sodium. The formula of such a persulphate is represented by $R_2S_2O_8$. In this formula R stands for the radical, which may be potassium, ammonium, or sodium. While otherwise it is necessary to wash for hours before the wash-water no longer gives a yellow precipitate with silver nitrate, the employment of persulphate effects the removal of all fixing agents in a far shorter time, and the subsequent discoloration of the plate is prevented. Properly a one-per-cent. solution of persulphate may be employed. The solution must not be too much concentrated, in order to avoid an oxidation of the silver. The solution may also be made slightly alkaline. The effect of slightly acid solutions is not so favorable.

No. 531,012. Photographic Plate=holder. John E. Thornton and Edgar Pickard, Altringham, Eng.

This invention relates to plate-holders for the sensitive plate and is designed to render such holders more efficient.



It consists essentially in constructing that part of the frame into which the plate is placed with a fixed ledge on every side, between which the plate is placed and fitting closely thereto with a rabbet or widen out recess at the top edge, and a movable strip or spring bar at the bottom to slide over the fixed edge to form a groove or recess at the bottom edge, a spring or springs being placed below the same, and with a spring or springs to press the plate outward when released and render it easy of being handled.

OUR QUARTERLY COMPETITION.

No. 5.—GENRE STUDIES.

For the best genre photographs we offer the following:

First Prize: A Silver Medal and Photographic Times Certificate of Merit.

Second Prize: A Bronze Medal and Photographic Times Certificate of Merit.

Third Prize: A Bronze Medal and Photographic Times Certificate of Merit.

Photographic Times Certificates will also be awarded to three other competitors, to be decided by the judges, if the work be sufficiently meritorious.

RULES.

Rule 1.—All entries must be forwarded to Editor Photographic Times, 423 Broome Street, New York, and marked "Competition."

Rule 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and the coupon to be found upon one of the advertisement pages should be cut out and filled in with name and address, together with a few particulars regarding the photograph and any other details of interest, and inserted in a sealed envelope, upon the outside of which the *nom de plume* must be clearly repeated.

Rule 3.—The competition to be an open one. Any number of pictures may be sent, but each one must be accompanied by a coupon and a different *nom de plume* used in each case.

Rule 4.—All pictures for competition must be sent prepaid.

Rule 5.—The whole of the work entered must be the work of the competitor—that is to say, the exposure, development, printing, toning, mounting and finishing.

Rule 6.—The prints must be mounted. Framing optional.

Notes.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious The possession of a Photographic Times Medal will, therefore, be a guarantee of a high order of merit.

The editors reserve the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competion will not be returnable.

The last day for receiving entries will be March 31. The awards will be announced as soon after as possible.

SPECIAL LANTERN-SLIDE COMPETITION.

For the best set of six lantern slides we offer one silver and one bronze medal in each of the following classes:

I. Landscapes.
II. Marine pictures.
III. Genre studies.
IV. Scientific subjects.
V. Architecture.
VI. Portraiture.

RULES.

Rule 1.—Entries may be made in any or all of the different classes, and must consist of six slides for each set entered, sent prepaid.

Rule 2.—Both the original negatives and the slides must be the entire work of the competitor.

Rule 3.—No competitor will receive more than one prize in any single class.

Rule 4.—The coupon to be found in the advertising pages must be filled up and sent with the slides.

Rule 5.—The size of the slides should be 3¼ x 4, or 3¼ x 3¼. When viewing the picture in its natural position the label containing the title must be to the right, and the thumb label on the lower left hand corner.

Rule 6.—Sets receiving the awards will become the property of The Photographic Times, and will be loaned to the principal photographic societies. The remainder will be returned at the expense of the competitors, if so desired.

This competition will be closed on the 30th day of June, 1895.

PICTURE COMPETITION.

With each issue we intend publishing three or four full-page reproductions.

We shall be pleased to receive pictures for this purpose, and for each one used we will send The Photographic Times free, for six months, to any part of the world.

For pictures that are found only suitable for smaller reproductions, we will send the magazine for three months.

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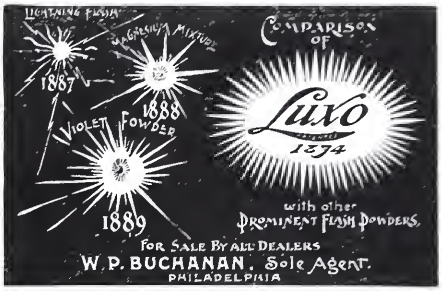

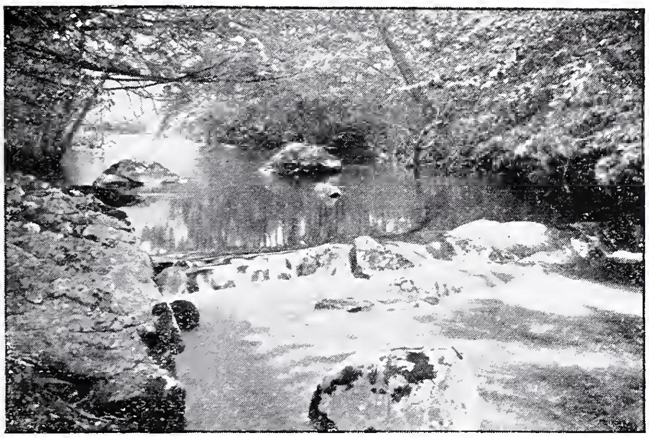

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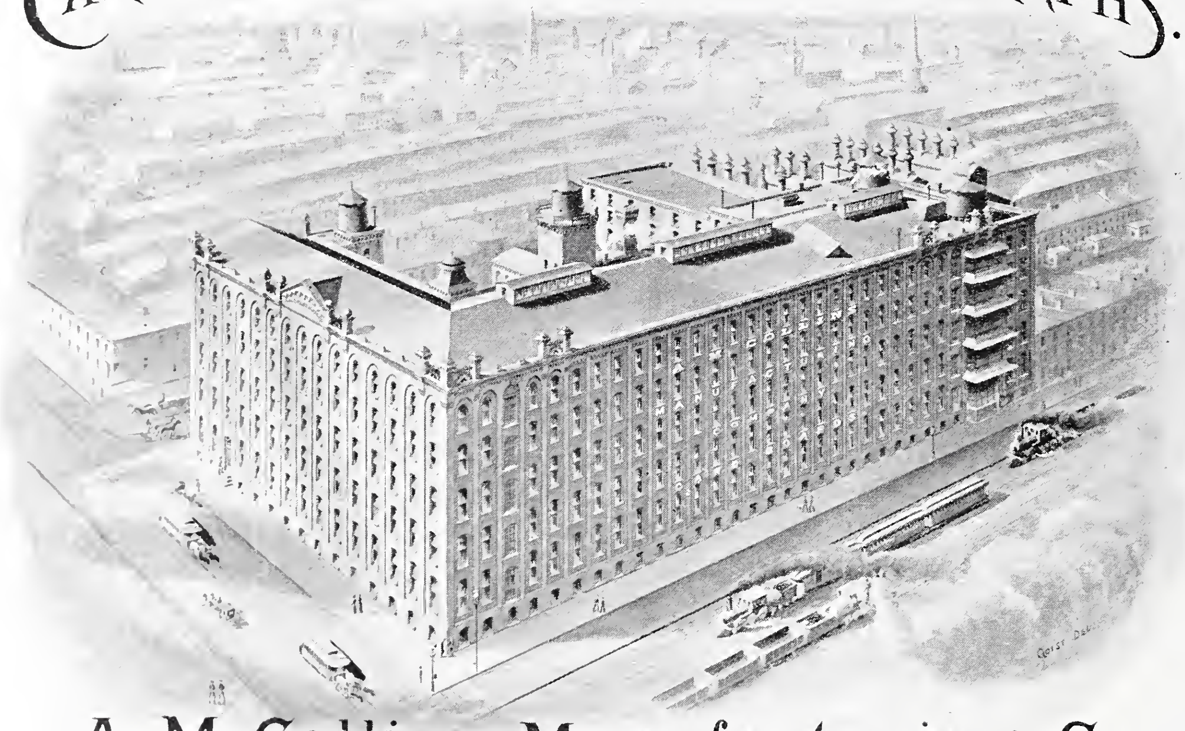

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THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY
WALTER E. WOODBURY.

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ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
W. I. LINCOLN ADAMS, MANAGER,
423 Broome Street, New York.

LONDON: JONATHAN FALLOWFIELD,
146 Charing Cross Road, W.

ITEMS OF INTEREST.

W. P. Buchanan, the well-known and popular importer and dealer in photographic supplies at 1,226 Arch Street, Philadelphia, will give his second Annual Lantern Slide Entertainment, "*Hic et Ubique*," at St. George's Hall, Wednesday evening, January 23. There will be souvenirs of the entertainment.

The New "Empire" Camera, both No. 1 and No. 2, which was introduced by the Scovill & Adams Co. just before the holidays, was sold everywhere like the proverbial "hot cakes." The supply was exhausted several days before Christmas. The "Henry Clay," both "Regular" and "Junior," was also very popular with Santa Claus.

The Chicago Photo Stock Company, with C. R. Stevens and George P. Mackin in the management, has started on a successful career in Chicago, buying out the stock and good-will of Hiram J. Thompsou, and adding to it a choice selection of the best goods. Mr. Stevens has had an experience of nine years in the photographic business with Sweet, Wallach & Co., and is one of the most popular photographic merchants in the country. Mr. Mackin has been with Mr. Thompson for more than ten years. The new company is bound to succeed, and we wish them well.

The Testimony of a Photo-Engraver.—"I have sold more of your (The Scovill & Adams Co.) plateholders than any other man in my line, but you have never heard from me direct. I think they are great. I sold the last in New Orleans through the supply house of S. T. Blessing to George F. Muguier Electric Engraving Co. I have sent you business from Chicago, St. Louis, Milwaukee, Cincinnati and Pittsburg, for I can claim by experience that your photographic appliances and photo-engraving goods are second to none in the world."—W. H. MACFARLANE, 516 Prince street, Knoxville, Tenn.

Extended.—For the benefit of those of our subscribers who sent in $5 for a renewal of their subscription, or for a new subscription, before the reduction in the subscription price was anounced, we wish to explain that all such subscriptions have been extended three months.

John R. Clemons, the veteran manufacturer of mat surface and leatherized salted paper, has recently prepared for the Scovill & Adams Company some very fine arrow root coated salted paper which will be found to possess superior qualities. Mr. Clemons has improved his preparation, as well as his method of coating, and has a product now which will commend itself to all practical workers. We advise photo-engravers and all interested parties to try a dozen sheets of this new paper. Price, 85 cents.

Mr. W. H. H. Clarke, the learned editor of the St. Louis and Canadian *Photograper*, has recently been experimenting with the Nepera Bromide paper, and writes as follows in regard to it:

"I demonstrated some samples before a number of photographers, and they were delighted with it. * * * I think if the paper was properly brought before the photographers of this city they would many, if not all, use it. The people are delighted with the prints made upon it."

A Good Stereopticon Tripod.—The New England Illustrated Lecture Bureau writes as follows in regard to the tripod recently made by the American Optical Company:

"We wish to say here that the tripod, more than pleases us. It has given perfect satisfaction so far, and it is the best thing of the kind we have ever seen. There is no shaking or moving of any kind. We have tested it with about thirty pounds. If you would advertise it as a stereopticon tripod we think it would materially increase the sale of same."

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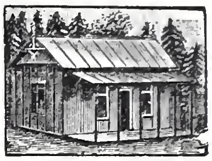

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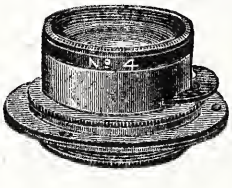

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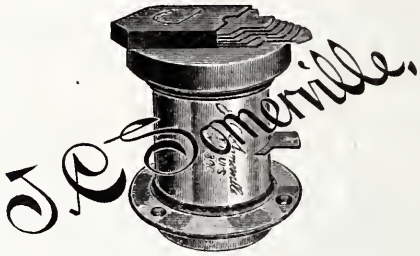

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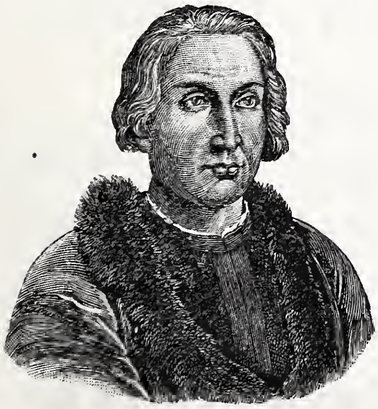

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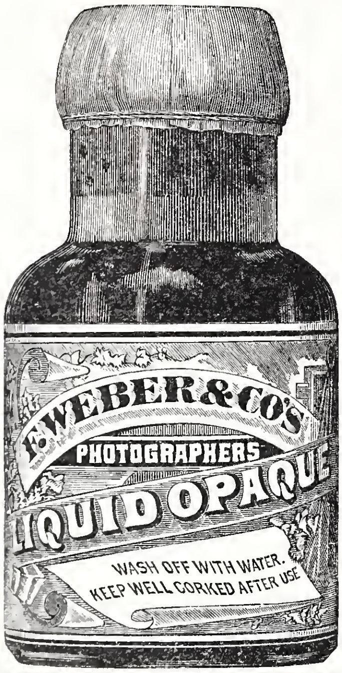

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6	1 "	8 x10 "	8 "	" 30.00	
7	1¼ "	11x14 "	10½ "	" 40.00	These 2 sizes will fit into 1 flange.
8	1¼ "	14x17 "	14 "	" 50.00	

☞ Nos. 1 to 6 are all made in matched pairs for stereoscopic work. The shorter-focused lenses are especially adapted for street and other views in confined situations. For general purposes, a pair of No. 5 lenses will be found most useful.

FOR SALE BY ALL DEALERS.

W. HEUERMANN,

IMPORTER OF

TRAPP & MÜNCH'S

Albumen Paper, Salted Paper,

ARISTO CHROMO PAPER

For Coating with Gelatine or Collodion.

No. 23 CEDAR STREET, New York.

The "Boston Mat" was designed by Wm. G. Reed, of the Boston Camera Club, for the purpose of simplifying the task of mounting slides, having the openings all *harmonious*, if not uniform, and to enable the maker to so prepare a set that all will "register" when projected.

TESTIMONIALS.

Mr. Wm. G. Reed.
Dear Sir:—Your mat is the "greatest labor-saving invention of the age." Please send me two hundred more.

Mr. Garrison Reed.
Dear Sir:—I have just returned from Japan with several hundred unmounted slides, which I wish to mat with the "Boston Mat." I have told many people of the excellence of your mat, and shall continue to do so, for to me it seems the only sensible one.

Mr. Wm. G. Reed.
Dear Sir:—I have found your ingenious lantern-slide mat exceedingly convenient and useful.

The originals of above letters may be seen in our New York Office.

The Boston Mat

(PRICE FIFTY CENTS PER HUNDRED),

Is for sale by the trade generally. If your local dealer has none, send order to

THE SCOVILL & ADAMS CO.,
SOLE AGENTS,
423 Broome Street, NEW YORK.

MERCK'S SUPERIOR PYRO.

FOR SALE BY ALL DEALERS.

Edwards's Special Transparency Plates.

For LANTERN SLIDES, Window Transparencies, and Reproductions in Black-and-White.

These Plates make the most perfect Lantern Slides, either by contact printing by artificial light or by means of the camera from larger or smaller negatives and give, at will, either engraving black or rich warm purple tones; they are also specially suitable for reproductions of line subjects for photo-lithography, when used for this purpose with our improved Pyro Transparency Developer, they give any desired density with perfectly bare glass in the high lights.

Price, 3¼x3¼ (English Lantern Size), 75 cts. per doz.

Edwards's Special Pyro Transparency Developer.

For Lantern Slides and Transparencies.

By means of this new Developer the most perfect Transparencies can be obtained on suitable Dry Plates with the greatest facility. It is the only Developer yet discovered which will produce (on Rapid Gelatine Plates) Lantern Slides of the highest class with RICH WARM TONES and perfectly clear glass in the highest lights.

Price, Two 8-oz. Bottles in Case, $1.50.

B. J. EDWARDS & CO., Manufacturers.

For Sale by THE SCOVILL & ADAMS CO.

THE SCOVILL MAGNESIUM COMPOUND

IS ENTIRELY FREE FROM POISONOUS INGREDIENTS.

In order to demonstrate this, quantities have been eaten at various times. We have often pounded it in a mortar to show that it does not explode.

Price of Scovill Magnesium Compound.

In ounce bottles, with fuses	$0 50
In quarter pound cans, with fuses	1 40
In half " " " "	2 65
In one " " " "	5 00

Price of Scovill Magnesium Cartridges.

		Per Doz.	Per Gro.
No. 1.	Small size, 20 grains	$0 50	$6 00
" 2.	Medium, 40 grains	80	9 00
" 2½	Large, 60 grains	1 20	13 00
" 3.	Extra Large, 80 grains	1 50	17 00

Standard Papers for Photographic Processes.

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FOR ALBUMENIZING, ARISTOTYPE (GELATINE AND COLLODION), BROMIDE, SOLAR ENLARGEMENTS, PLATINOTYPE, CHLORIDE, ETC., ETC.

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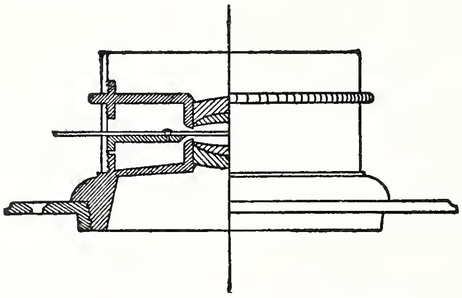
THE UNRIVALED
STEINHEIL LENSES.

SERIES IV. **Rapid Wide-Angle,** specially designed for landscape work and architecture, but can also be advantageously used for flash-light interiors and copying.

SERIES  V.

Extreme Wide-Angle, for architecture and interiors, and for very high, broad objects taken from short distances.

THE SCOVILL & ADAMS CO.,
423 BROOME STREET,
NEW YORK, N. Y.

Have
You
Tried
THE ZEISS?

No!

Better do so at ONCE.

The Scovill & Adams Co.
Have Them.

REGISTERING SLIDES.

(PATENTED.)

In the pleasure or excitement attendant upon picture-taking, holders slides have been so changed about that the note-book afforded no clue to their identity. All photographers, whether professional or amateur, who have in time past puzzled their brains in the endeavor to solve such vexatious questions as these—

"Have I or have I not exposed that plate?"
"If exposed, was the plate used for that prized picture?"
"Shall I incur the risk of making a double exposure?"

henceforth will have themselves only to find fault with if they do not procure and use in their dry-plate holders the patent registering slides, or as they have been called "Record Slides." These can be written upon with slate or lead pencil *ad libitum,* and the writing erased without injury to them.

Registering Slides *will be supplied with new American Optical Co.'s Dry Plate Cameras and Amateur Outfits up to* 10x12 *size without addition to price list.*

MAXIMA
ARISTOTYPE PAPER.

FOR PROFESSIONAL AND AMATEUR.

A Gelatine Printing-Out Paper which does not Curl, Crack or Blister.

Trade Mark.

	Doz.	Gr.		Doz.	Gr.		Doz.	Gr.		Gr.
3¼ x 4¼	$0 15	$1 50	5 x 7	$0 33	$3 50	8 x 10	$0 70	$8 00	3⅞ x 5½ Cabt. Trim.	$1 70
4 x 5	20	2 00	5 x 8	35	4 00	20 x 24	4 00	48 00	Cabinet 2ds	1 00
4¼ x 6½	30	3 00	6½ x 8½	60	6 00					

Maxima Combined Toning and Fixing Solution, 8-ounce bottles, 30 cents.

MANUFACTURED ONLY BY

United States Aristotype Co.

BLOOMFIELD, N. J.

Sample of Paper
Free upon Application.

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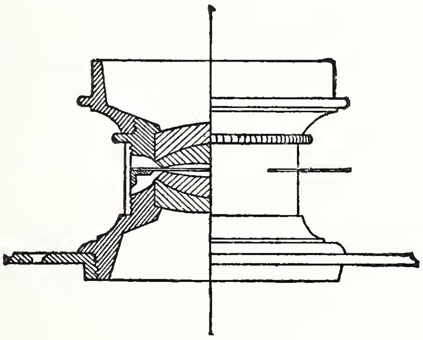
WIDE-ANGLE COPYING APLANAT.



SERIES VI.

Specially designed for copying line work, paintings, engravings, etc. Without a rival for microscopic sharpness evenly divided over the whole field.

Steinheil Prisms, Series VII—For use in connection with the above lenses for obtaining reversed negatives without stripping the film.

The above lenses and prisms are being extensively used in the largest photo mechanical establishments in preference to the most expensive lenses of other types.

Write for catalogue to

THE SCOVILL & ADAMS CO.,
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OR YOU WILL LEARN SOMETHING ABOUT

Red Label BP Paper

EXTRA.

It is the Ideal paper for professionals and amateurs. Nothing to equal it.

If you are not afraid of being convinced, try it.

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C. M. HAYES & CO.
(INCORPORATED.)
PHOTOGRAPHERS.

246 WOODWARD AVE.,
DETROIT, MICH., NOV. 13, 1894.

ALLEN BROS.

Gentlemen: A Lens that we can use for Portraits must combine speed, softness, definition and roundness; these points are first, price next. Your **SUTER LENS** sold us has all of these requirements, and we take pleasure in advising its use whenever others want the same.

Yours truly, C. M. HAYES & CO.

Send for price list and testimonials to the Sole Agents for the United States,

ALLEN BROS., Photo Materials,
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FOR SALE—

All Material and Apparatus used in Photography. Orders filled promptly at lowest rates.
Kodaks in full supply.

W. D. GATCHEL, Agt.,

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ABSOLUTELY PURE.

We have at last obtained a Photo Blotting Paper (The Albion) which is absolutely chemically pure. It is a very different article from ordinary blotting paper, which always contains more or less impurities that are injurious to photographic prints. This paper may be used in the most delicate photographic operations with perfect safety. We had it especially made for photographers' purposes, and can unhesitatingly recommend it.

Price per Half Ream,	-	**$12 00**
" " Dozen Sheets,	-	**72**

ASK YOUR DEALER FOR

Albion (100 lb.) Photo Blotting Paper.

THE SCOVILL & ADAMS CO.,
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SWIFT

Lenses are the Best.

TRY THEM BEFORE

PURCHASING

ANY OTHER MAKE.

WALE & MATHEIN,

MANUFACTURERS OF

HIGH-GRADE PHOTOGRAPHIC LENSES,

MARKSBORO, NEW JERSEY.

We invite comparison with any other make, at whatever price. Lenses sent for trial.

RAPID RECTILINEAR LENSES,

complete with shutter having "silent time" and adjustments for all degrees of speed, with pneumatic release, the workmanship of which we guarantee of the very best.

4 x 5,	6	inches focus	$13 00
5 x 7,	9	" "	15.00
6½ x 8½,	10.5	" "	25.00
8 x 10,	12.5	" "	40.00
6½ x 8½,	10.5	" " without shutter	18.00
8 x 10,	12.5	" " " "	30.00

ANASTIGMATIC WIDE ANGLE LENSES.

5 x 8,	5.5	inches focus	$15.00
6½ x 8½,	7	" "	20.00
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Double Exposure Attachment for Wide Angle, 4 x 5 and 5 x 7 R. R. Lenses, $2.50. Larger sizes at a small additional cost.

CLEMONS' NEW MATT-SURFACE PAPER.

SOMETHING NEW UNDER THE SUN—A REVOLUTION IN THE ART OF MANUFACTURING.

After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

I.—Constant use will not discolor the silver bath.
II.—Will produce the finest detail in printing.
III.—Any desired tone may be obtained from sepia to jet-black with less gold than ever before.
IV.—The "*New Matt-Surface*" paper when sensitized will keep fresh for a long time if properly stored.
V.—The price has not been advanced.

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THE SCOVILL & ADAMS COMPANY,
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Sample Sheets, by mail, 10 cents each.

NEW AND GOOD.

MERCK'S SUPERIOR PYRO.
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WOODBURY ANTIPYR.
S. P. C. ACID FIXING AND HARDENING COMPOUND.

TRY THEM. **FOR SALE BY ALL DEALERS.**

The result justifies the expense.

$55

buys a Henry Clay Camera, and you get a $55 result in every picture.

Our Henry Clay Manual tells all about it. Free.

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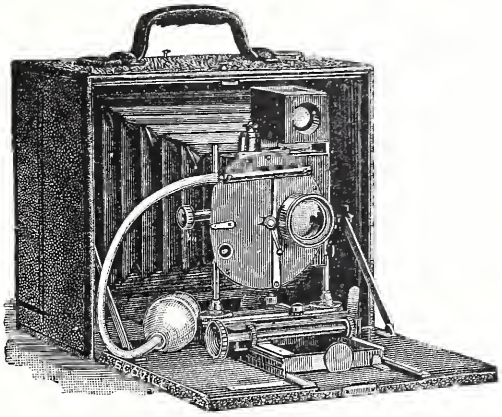

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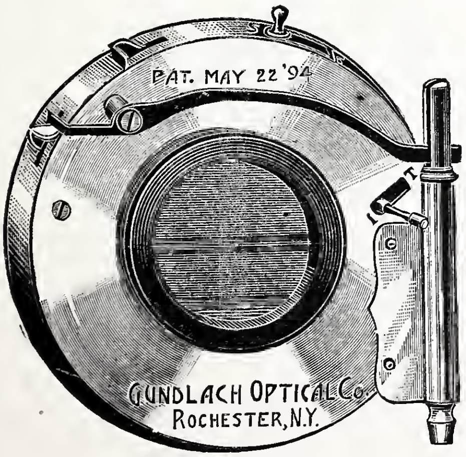

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Photographic Lenses,

PHOTOGRAPHIC SHUTTERS,
MICROSCOPES,
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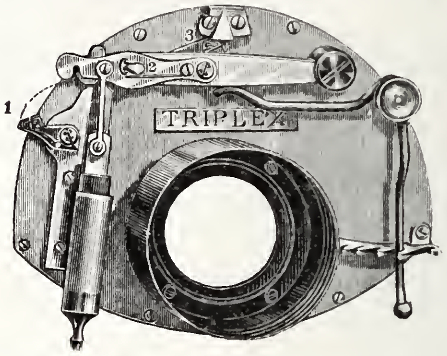
OUR NEW PHOTOGRAPHIC SHUTTER Is the **Best** and **Cheapest** Shutter in the market. It sells at about half the price of other first-class shutters. **Send for Catalogue.**

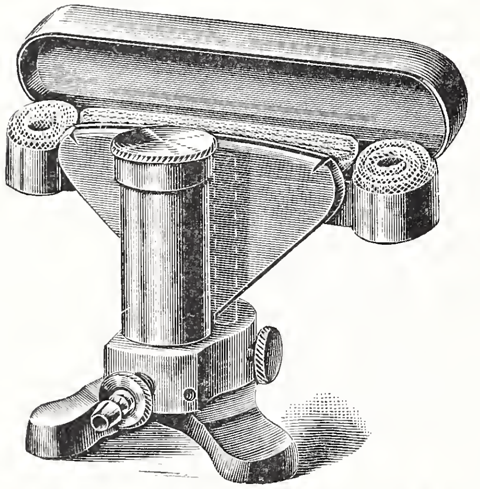
THE TRIPLEX TIME SLOW-INSTANTANEOUS INSTANTANEOUS SHUTTER

Is the BEST Shutter to use at ALL times, but especially at the season when the light is weak, as it gives nearly twice as much illumination under the same circumstances as most other shutters.



Exposures TIME, SLOW-INSTANTANEOUS, and RAPID-INSTANTANEOUS.

Average maximum speed of ALL sizes about $\frac{1}{150}$ second; smaller sizes much greater.



Our Storage Flash Lamp

is without doubt the BEST and most powerful portable Flash Light device on the market.

IT GIVES SATISFACTION.

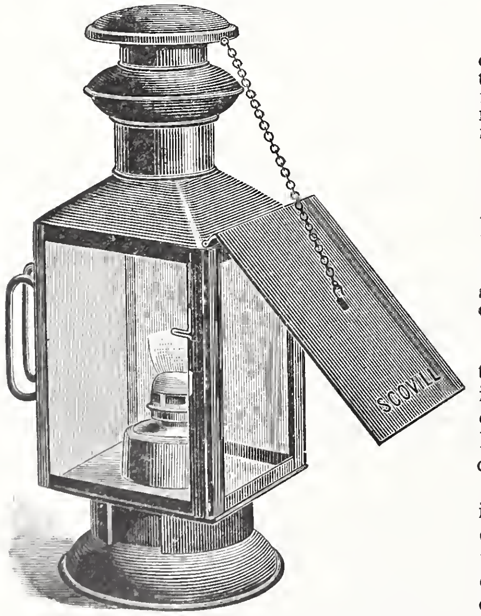
Send for Catalogue—

PROSCH MFG. CO.

389 Broome Street, NEW YORK.

THE SCOVILL PEERLESS DARK-ROOM LANTERN.

(IMPROVED.)



"This is without question the best Lantern for the Photographer's use yet introduced."

Such is the reports of experts who have had them in use for months.

Why they were agreed in their conclusions:

BECAUSE the ventilation is perfect, and danger of overheating overcome.

BECAUSE it is constructed so that white light does not escape.

BECAUSE it gives ample light for the dark-room.

BECAUSE the abundant light does not fog, but does show any spot or blemish in the plate.

BECAUSE so much of the light may be thrown into the developing dish and be shaded from the eyes.

BECAUSE it may be used either with coal oil or candle.

BECAUSE the flame may be so quickly controlled by unlatching the door or uncatching the bottom of the Lantern.

PRICE, $2.50.

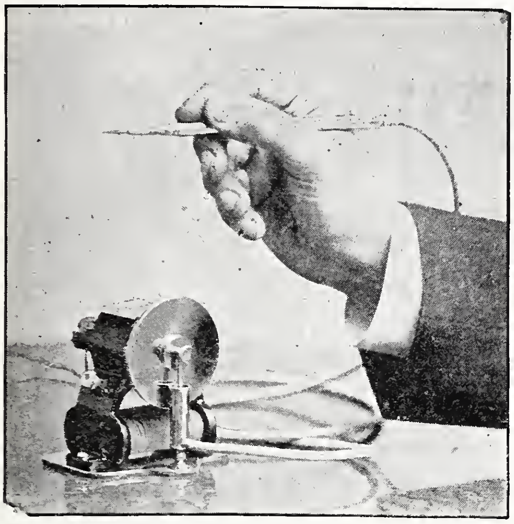
"NON-COCKLE,"

FOR MOUNTING PRINTS.

40 Cents per Bottle.

THE SCOVILL & ADAMS CO.,

Trade Agents.



Peck's Pneumatic Retoucher.

(PATENT APPLIED FOR.)

A SIMPLER DEVICE FOR ASSISTING THE RETOUCHER WAS NEVER INVENTED.

A glance at the illustration will give an accurate idea of what it is.
In the first place, there is no other machine on the market to-day using

AIR AS A MOTIVE POWER.

In the second place, there is absolutely no more weight on the hand than an ordinary lead pencil would be.
In the third place, a retoucher can sit down and do in one hour with the machine what would require three hours work by hand.
Another thing. While we do not claim that a novice can sit down and do as perfect work with it in the start, we do say that with a little practice he can do the work of the average gallery, and do it well.
The outfit, complete, consists of a battery enclosed in a neat wood case, a motor with pump attached, as shown in the cut, a metal lead holder, which is used in the manner shown in the cut, and the necessary rubber tubing, wire, etc., including a cut-out switch, for starting and stopping motor.
We will furnish the motor, pump and pencil, without the battery where desired, so as to permit photographers owning batteries to use theirs.

The Price of the above, complete, is $25. Without Battery, $18.

EVERY OUTFIT IS GUARANTEED TO GIVE SATISFACTION.

DIRECTIONS FOR SETTING UP PECK'S PNEUMATIC RETOUCHER FOR USE.

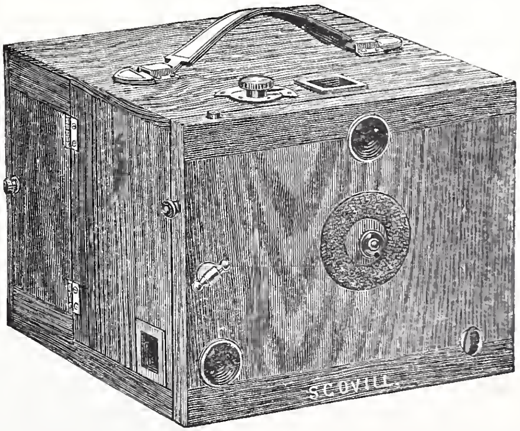
TO CHARGE THE BATTERY.—When it is practicable, always make the solution in some large earthenware vessel, and allow it to cool before setting up the battery. Dissolve one package of caustic potash in enough water to fill the jar up to the first line. Immerse the plates in the solution. Raise one side of the lid high enough to pour the contents of one of the bottles of oil into the solution. Repeat operation with each cell.
TO CONNECT BATTERIES.—Attach the wires exactly as you find them when receiving the battery, viz.: Connect the zincs of one battery to the copper oxide plate of the other. Place the battery under a table and screw the switch to the top of same beside the motor. Fasten the wire to the motor. Fasten the motor down to the table. Attach the tubing to the pumps and to the pencil. Everything is now ready for use.
TO REGULATE THE STROKE.—Loosen the thumb screw on the fly wheel of the motor, and move the sliding bar to or from the centre as may be desired. The nearer the centre it is the finer the stroke of the pencil will be. Moving it further out increases the force but diminishes the rapidity of the stroke of the pencil somewhat.

FOR SALE BY ALL DEALERS.

H. A. HYATT, MANUFACTURER AND TRADE AGENT,
PHOTOGRAPHIC SUPPLIES,
N. E. COR. EIGHTH AND LOCUST STS., ST. LOUIS, MO.

REDUCED ONE THIRD!

THE IMPROVED
ANTIQUE OAK
DETECTIVE CAMERA.



Which was introduced to meet the demand for a cheap Detective Camera within the reach of the youth, and of those who want to make but a moderate investment in photographic appliances, *has been made still cheaper.*

No. 1, 4x5 Antique Oak Camera,	former price,	$15.00,	Reduced to $10.00
No. 2, 4x5 Leather Covered	" "	17.50,	" 12.50

MANUFACTURED BY

THE AMERICAN OPTICAL COMPANY.

FOR SALE BY ALL DEALERS, AND

THE SCOVILL & ADAMS COMPANY.

GEO. L. DAMON, PRESIDENT. J. DEXTER RECORD, VICE-PRESIDENT. GEO. D. LEAVITT, TREASURER.

New York Dry Plate

MANUFACTURED BY

New York Dry Plate Company,

BRANDS:

RECORD	**HARVARD**	**CRESCENT**
Extreme Rapidity.	Rapid.	Slow.

Orthochromatic, Non-Halation, Lantern and Tropical Plates.

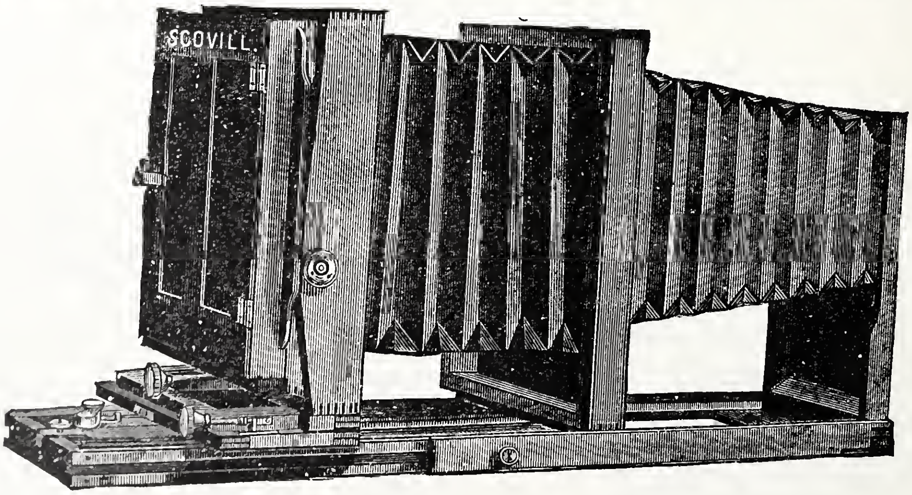
WORKS AT GUTTENBERG-ON-HUDSON.

OFFICE, 823 BROADWAY, NEW YORK.

The Record and New York Dry Plate Companies Consolidated.

THE AMERICAN OPTICAL COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical snifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
14	22x27 "	" " 72 " do	130 00
15	25x30 "	" " 80 " do	170 00

EVERYTHING FOR THE CAMERA.

Have You Tried the : : :

NEW **ROSS-GOERZ** LENS?

American Agent for Ross Lenses.

ROSS Portrait and View Lenses.
ROSS-ZEISS Anastigmatic Lenses.
ROSS-GOERZ Double Anastigmats.

All Brands of : : :
DRY PLATES, PURE CHEMICALS AND SUPPLIES of all kinds.

ALL THE LATEST HAND AND TRIPOD CAMERAS.

Descriptive Catalogues of any of the above sent on receipt of five cent stamp for postage.

W. C. Cullen, 61 WILLIAM STREET,
New York.

A GREAT CONVENIENCE IN DEVELOPING DRY PLATES.

Pelletone

PYROGALLIC

ACID TABLETS,

Put up in bottles, each containing 100 2-grain (*exactly* 2 grains) tablets of

SCHERING'S

Unrivaled Pyrogallic Acid

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Price per Bottle, reduced to 40 Cents.

For Sale by all Dealers, and

THE SCOVILL & ADAMS CO.

Felt Backgrounds.

The Scovill & Adams' Plain Felt Background, recently introduced, is a great boon to all Photographers, both Professional and Amateur.

It is made of strong, thick and even stock, and is of an agreeable neutral drab color. It is especially suitable for vignetting. The texture of the cloth absorbs instead of reflecting light, and thus produces soft effects, and agreeable depth in print. The liability of defacement by water stains is obviated.

The prices of these grounds are as follows:

4 x 6 feet	$2.50
5 x 6 "	2.75
6 x 6 "	3.00
6 x 7 "	3.50
6 x 8 "	4.00

These sizes may be sent by mail on receipt of 35c. extra.

For Sale by all Dealers in Photographic Goods,
or by
The Scovill & Adams Co.
423 Broome Street, New York City.

CARBUTT'S DRY PLATE AND FILM WORKS.

Original American Dry Plate Factory.
ESTABLISHED 1878.

JOHN CARBUTT PROPRIETOR
TRADE MARK

Office and Factory : Wayne Junction, Philadelphia.

We reduce our prices to suit the times; see following price list:

AND HAVE NO CONNECTION WITH ANY DRY PLATE RING OR TRUST.

ECLIPSE and ORTHO. 27.

Process and "A."

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¾ x 4¼	$0 40	......	36
4 x 5	60	$0 80	36
4¼ x 5½	70	90	24
4¼ x 6½	80	1 05	24
4¾ x 6½	90	1 10	24
5 x 7	1 00	1 25	24
5 x 8	1 13	1 45	24
6½ x 8½	1 50	1 95	12
7 x 10	2 00	2 45	12
8 x 10	2 15	2 80	12
10 x 12	3 40	4 40	4

Reduced 10 per cent. from old list.

"B" 16 and 20.

Special and Ortho. 23 and 25.

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¼ x 4¼	$0 38	....	36
4 x 5	55	....	36
4¼ x 5½	65	....	24
4¼ x 6½	75	.. .	24
4¾ x 6½	85	....	24
5 x 7	94	$1 25	24
5 x 8	1 05	1 45	24
6½ x 8½	1 40	1 95	12
7 x 10	1 80	2 45	12
8 x 10	2 04	2 80	12
10 x 12	3 25	4 40	4

Reduced 15 per cent. from old list.

COLUMBIAN ANTI-HALATION PLATES.

Sens. 23 to 27. Eclipse and Ortho.

Sizes.	Plain.	Strippers.
3¼ x 4¼	$0 50	....
4 x 5	70	....
4¼ x 5½	80	....
4¼ x 6½	95	....
4¾ x 6½	1 05	....
5 x 7	1 15	$1 40
5 x 8	1 30	1 55
6½ x 8½	1 75	2 10
7 x 10	2 20	2 65
8 x 10	2 55	3 06
10 x 12	3 95	4 75

Larger sizes up to 24 x 36 at proportionate reduced prices.

CARBUTT'S LANTERN PLATES lead all other makes, 55 cents per dozen, 36 dozen in a case.

Specialties:
Carbutt's Patent Dry Plate Lantern,
Carbutt's Pyro and Potash Developer,
Carbutt's Eiko-cum-Hydro Developer,
Roxyline Enamel for Negatives and Positives,
J. C. TABLOIDS, for Home use and Tourists.
Color Screens for the PHOTO-CHROMIC PROCESS.

FOR SALE BY ALL MERCHANTS IN PHOTOGRAPHIC MATERIALS. SEND TO FACTORY FOR CATALOGUE.

Look out
for
imitations
of

WATERBURY
CARDBOARD.

Look out
for the
genuine, too,
and see
that you
get it.

It is
the Best
and Cheapest.

CARBUTT'S

"G. A" LANTERN PLATES.

THE UNIVERSAL PLATE.

Made on Specially Imported THIN CRYSTAL GLASS, Size 3¼ x 4, 55 Cents per dozen.

Are the perfection of Plates for producing Slides by contact, or reductions in the Camera. Their qualities are too well known to need further recommendation.

Owing to our new method of packing these plates, they are more perfectly protected and less liable to abrasion.

For Developer, we recommend either our EIKO-cum-HYDRO Two-Solution Developer, or our J. C. TABLOIDS. A powerful Developing Agent, allows one-half exposure. Price, 75 cents per box, post free, containing 96 Tabloids, enough to develop 8 to 12 dozen 4 x 5 Plates or Films, and twice or more that number of Lantern Plates.

CARBUTT'S GROUND GLASS TRANSPARENCY PLATES

For Making Beautiful Window Transparencies.

The above Transparency Plates were the ONLY onces receiving the World's Fair Award.

☛ SEND TO FACTORY FOR CATALOGUE OF PLATES AND SPECIALTIES.

FOR SALE BY ALL DEALERS.

NOW IS THE TIME FOR FLASH-LIGHT WORK.

AND YOU WANT A GOOD MACHINE.

The Hunter Flash-Light Machine

IS THE BEST.

We have in this machine an apparatus specially arranged for the distribution of the light all over a large surface, and the system employed in igniting the powder is such that the greatest illuminating power possible is obtained from a given quantity of powder. As a matter of fact, this is over twenty times greater than the luminosity that would be obtained by burning the powder in a mass.

The advantages of this machine are that it can be taken apart or put together in less than three minutes. The tripod, although the lightest made, is the most rigid when set up, and can be raised higher and dropped lower than any other machine.

The principle employed is simple and practicable, consequently it is not liable to get out of order or fail when using.

The powder is thrown into the flame by the stroke of the hammer under the pan which separates and spreads the powder over a large surface, and so giving a far more brilliant light than would be obtained by the usual method of throwing the powder in the flame; as the powder being separated burns much quicker and the combustion is more perfect, not a grain of powder can escape ignition.

Where gas cannot be conveniently used the inventors recommend an alcohol machine devised by them. It is a very simple arrangement, and certainly to be preferred to the dangerous gasolin.

Send for circular giving complete description and directions.

PRICE, Reduced from - - $75 to $45

FOR SALE BY ALL DEALERS AND

THE SCOVILL & ADAMS COMPANY.

THE HAMMER DRY PLATE

Satisfies those who want the BEST.

For they are the standard of . . . .

Excellency, Rapidity and Uniformity.

To-day are even better than ever.

INCOMPARABLE for the Studio.
for Landscape Photography.
for the Hand Camera.
for Interiors.

☞ ORDER THROUGH YOUR DEALER.

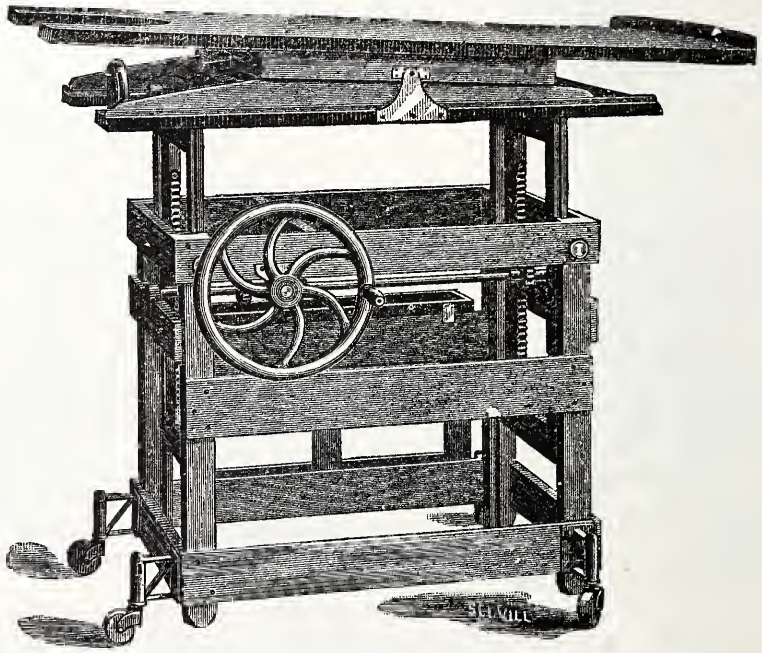
MANUFACTURED BY

HAMMER DRY PLATE CO.,
ST. LOUIS, MO.

THE "ELITE" STUDIO STAND. (PRIZE WINNER.)

These are the only Stands suited in workmanship and finish, also in size, to the large American Optical Co.'s Cameras, with their great length of bellows and extension platform. Practical portraitists cannot fail to admire the ease with which these stands can be adjusted at any desirable height or inclination, and the noiseless manner in which they may be moved from place to place, their elegant appearance and accurate construction.

Instead of the clumsy levers and racks, by which accurate adjustment of the platform was obtained in the older stands; the proper elevation and inclination are produced in the "Elite" stand by cog-wheel and snake screw, and the manipulation at one side by a wheel with handle, and within reach of the operator, so that he may adjust the height or inclination of this camera without taking his head from under the focusing cloth. By means of the wheel worked at the rear endof the platform, the horizontal position of the platform may be inclined upward or downward to a limit of 15 degrees. A great advantage from this movement, we observe, is that a true horizontal position—so difficult to obtain in the old camera stands—is, with these, an easy matter to effect. This is especially important to those who may use them for reproduction work. In the No, 2 size the platform is fifty-two inches long and twenty-five inches wide, and its length may be increased to seventy inches by an attachment which slides out forward, making it quite long enough for supporting a large copying camera. Then a semi-circular cut-out, to the rear end of the platform, is a convenience to the operator, who is thus enabled not only to stand closely up to the ground-glass, no matter how for the camera may have been pushed forward, but bending of the body is obviated, which is quite a necessity with all the older stands.



(Patented.

"ELITE" STUDIO STANDS.	No. 1 Size.	No. 2 Size.
PRICE, with Rack and extension for Plate Holder	$32.00	$36.00
Highest point from platform to floor	48	48
Lowest " " " "	32	32
Width of platform	22	26
Length of platform without attachment	45	52
" " with "	60	70

FOR SALE BY ALL DEALERS.

Our Celebrated Walpole Hypo.
(*Regular "Old Style" Large Crystals.*)

"New Process Walpole Hypo."
Trade Mark.
PUREST HYPO MADE.

Pure Walpole Sulphite Soda.

Products Unsurpassed.

Produce Fine Negatives.

Perfect Results.

Book on "Hypo" Free. **Photos** Exquisite.

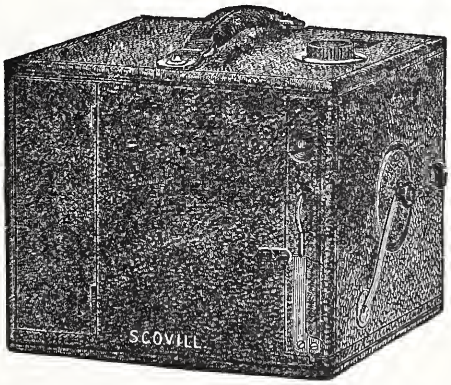
ACETIC ACID,
ACETATE OF LEAD,
ACETATE OF SODA,
ALUM POTASH,
ALUM CHROME,
CARBONATE SODA,
COPPERAS,
IRON SULPHATE,
OXALATE POTASH,
POTASH CARBONATE,
SODA ACID SULPHITE.

☞ We do not solicit retail trade. Where consumers cannot obtain our products from their usual sources of supply, we will furnish them on application; but it must be understood that in these cases we charge the full retail prices, and that cash must accompany the order.

Send 5 cents (stamps) for each sample or 25 cents (stamps) for 6 samples.

Walpole Chemical Co.,
Walpole, Mass.

THE WATERBURY DETECTIVE CAMERAS.



MANUFACTURED BY THE AMERICAN OPTICAL CO.

Timed and Instantaneous Photographs. This is the only Detective Camera which is as well adapted for making timed views as for photographing quickly moving objects. The negatives produced are of such sharpness that they may be enlarged to almost any size, It is

The only Detective Camera made for plate for tripod, and with ground-glass the full size of the plate, just as in an ordinary view camera. This ground-glass is where it cannot easily be broken.

The Recessed Finder shows *the same image* as is included on the ground-glass, though diminished in size. Without this accurate finder, one cannot be sure of what is taken in or left out of an instantaneous photograph.

The Focusing Scale is beside the Finder, where it may be readily seen and adjusted.

Price List.

	Leather Covered
4 x 5 Waterbury Detective Camera, with 2 Double Holders	$25 00
5 x 7 Waterbury Detective Camera, with 2 Double Holders	40 00

FOR SALE BY ALL DEALERS.

EVERY FIRST PRIZE
AT THE ST. LOUIS
CONVENTION
WAS AWARDED
TO WORK
MADE ON

CRAMER PLATES.

WAS IT BECAUSE
THE BEST WORKMEN
USE THEM, OR THAT
THE PLATES WERE THE BEST.
OR WAS IT BOTH

?

When purchasing a Developer
please be particular to specify **Schering's** the oldest and most
favorably known brand.

Put up with labels and seals as per fac-similes here given.

ONE OUNCE
PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

REGISTERED. REGISTERED.

THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none.

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY, NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

THE CLIMAX PLATE.

THE LATEST PRODUCTION OF

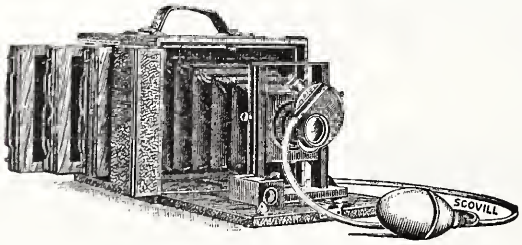
THE STANDARD DRY PLATE CO.

THEY ARE WORTHY YOUR TRIAL, FOR THEY ARE QUICK, CLEAN AND BRILLIANT, AND POSSESS THE VERY FINEST PRINTING QUALITIES.

THE PRICE, TOO, IS RIGHT.

ALL DEALERS SELL THEM.

The Henry Clay, Jr.



Partly owing to the march of progress, and partly to the present tight state of the money market, there has long been a demand for a hand camera which should possess all the necessary requirements for good work, but at the same time be obtainable at a reasonably moderate price. That we have successfully met this with our new Henry Clay Junior camera we think all will readily admit on seeing that apparatus. The superb workmanship of the Henry Clay camera is too well known to require any description from us, and we have only to say that, notwithstanding the considerable reduction in the price of the new camera, the finish is in almost every way equal. The Henry Clay Junior is now made in the two sizes, 4 x 5 and 5 x 7, and differs from the ordinary camera of these dimensions in certain points which we shall specify. It contains space for three holders, or six plates. A novel arrangement has been added by which the holders can be slipped into place without the usual inconvenience attached to such proceeding. The lens is a perfect little beauty, and does very fine work. The front portion has a sliding up and down movement for the lens but no swing; indeed, with a hand camera this is but very rarely necessary, such objects that require it are best left alone with small cameras. The camera front can be fitted into position with the greatest ease. The movement is the work of a second; by pressing the catch the front of the box falls down, a piece of brass is caught hold of, the camera comes forward to the scale and, with one-quarter turn, it is fixed as firmly as a rock into position The instrument is fitted with revolving diaphragms, reversible finder and an admirable little shutter, which can be used for time or instantaneous work. When closed the dimensions of the 4 x 5 camera are 5¾ x 7 x 6, including space for three holders. Altogether we can thoroughly recommend this instrument to all who require a first-class camera at a moderate price.

It is manufactured in the works of the famous

AMERICAN OPTICAL COMPANY.

Price, 4 x 5 size, $30.00, Price, 5 x 7 size, $38.00.

Including One Double Plate Holder.

Extra Holders for 4 x 5 size, $1.25 each. Extra Holders for 5 x 7 size, $1.30 each.

FOR SALE BY ALL DEALERS AND

THE SCOVILL & ADAMS COMPANY.

Some of our **Specialties:**

The American Optical Company's Apparatus
FINEST IN THE WORLD.

Swift, Steinheil and Zeiss (Imported) Lenses
ACKNOWLEDGED TO BE THE BEST.

Gundlach, Bausch & Lomb, and "Waterbury" (Domestic) Lenses
WITHOUT RIVALS IN POPULARITY.

Morrison Celebrated Wide-Angle Lenses
THE BEST IN THE WORLD.

"Three Crown" Albumen Paper
ABSOLUTELY WITHOUT FAULTS OR BLEMISHES.

Waterbury Cardboard
THE UNEXCELLED.

Merck's Superior Pyro, Andresen's (and Hauff's) Amidol, and Andresen's Sulphite of Soda

Prepared Developers
AND OTHER SOLUTIONS, READY FOR USE.

"The Greatest Annual on Earth,"
AND OTHER PHOTOGRAPHIC PUBLICATIONS.

Ilotype (Collodion), B P & Nepera (Gelatine)
AND ALL STANDARD BRANDS OF ARISTOTYPE PAPERS.

All Standard Brands of Dry Plates

Wuestner's Orthochromatic "Imperial" Non-Halation Plates and 50 Sens. "White Label"
THE VERY LATEST.

The New Columbian Developer
FOR UNDER-EXPOSED AND VERY RAPID PLATES.

Woodbury's Antipyr
FOR HARDENING GELATINE NEGATIVES AND PRINTS.

AND ALL STANDARD GOODS. **SEND FOR CATALOGUE.**

THE SCOVILL & ADAMS COMPANY,
423 Broome Street, New York.

If we say

Our Lenses are BETTER than ANY European product you may doubt us.

If we say

Our Lenses are as GOOD as the BEST you MAY believe us.

If we say

Compare our Lenses with those which YOU consider BEST, we secure your confidence.

Therefore we say

We make every variety of Lenses. When you contemplate buying, ask for one of OURS to compare with OTHERS. We give you a Test-Chart for this purpose. If OURS is ONLY as GOOD and CHEAPER, you will keep it.

Bausch & Lomb Optical Co.

New York City, N. Y.
Rochester, N. Y.

The Best Lenses in the World.

VOIGTLÄNDER & SON'S

RENOWNED

Improved Euryscopes

THESE are made in seven different series, for **all kinds of work** in the studio, outside, snap shots, interiors and copying. Positively excelling all other lenses in speed, definition, roundness, depth, and other desirable qualities so dear to every first-class artist. Used and highly endorsed by the leading professionals and amateurs of the world.

We carry also a full line of

THE ZEISS ANASTIGMAT LENSES,

Made, according to the Zeiss formulæ, by Voigtländer & Son.

Also the celebrated

DARLOT LENSES

For Portraits, Views and Stereopticons

☞ The Darlot Lenses are **surely genuine** when inscribed with our trade-mark "**B. F. & Co.**"

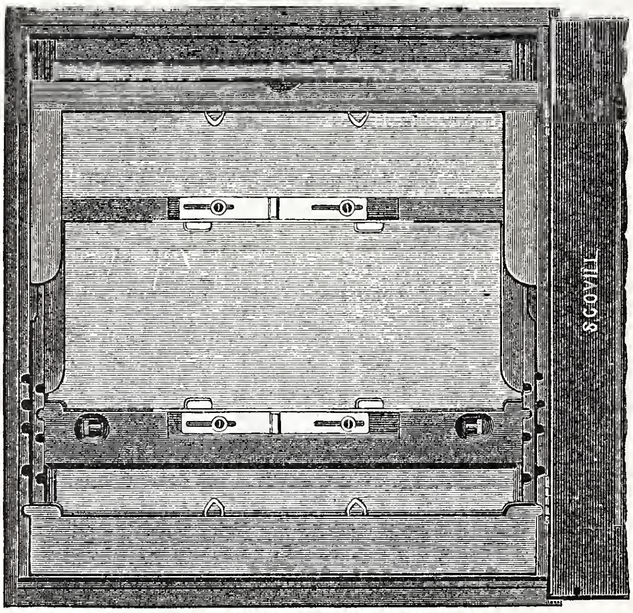
SOLE AMERICAN AGENTS

Benj. French & Co.

We carry a full assortment of the best COLLODION and GELATINE PAPERS, also the famous TRAPP & MÜNCH and "B. F." ALBUMEN PAPERS.

BOSTON, MASS.

The S. & A. Photo-Engraver's Adjustable Screen Plate Holder



[Patent applied for.]

This holder, as is shown in the cut above, is a great improvement over any heretofore manufactured for photo-engraving purposes. Its principal points of superiority are, briefly:

(First)—The ease with which it is adjusted for different size plates and screens, by a simple sliding movement of the two inside frames to or from the centre, and thus dispensing with the expensive and troublesome use of kit frames.

(Second)—The convenience by which the screen plate is accurately adjusted to the sensitized plate by means of the metallic sliding adjusters. (Heretofore it has been necessary to do the adjusting by means of inserting different thicknesses of cardboard, paper, etc.)

(Third)—Different thicknesses in the screen plates are allowed for by means of a spring which always holds the plate in accurate place no matter what its thickness may be.

(Fourth)—A graduated scale on each screen adjuster makes it easy to always insure absolute accuracy in determining the distance of the screen plate from the wet plate.

(Fifth)—The simplicity of construction and excellent workmanship of the entire holder, being made, as it is, in the factory of the famous American Optical Company.

And, altogether, it is an ingeniously designed and beautifully constructed holder which will be found of indispensable aid to the practical photographer.

These holders are thicker than the ordinary plate holders, and if it is desired to use them on a camera the ground glass of which is focused for the ordinary plate holder, a new ground glass frame is necessary in order to adjust the focus. When ordering a holder to fit a camera in use, send the old holder or the old ground glass frame so that the new ones can be made to fit the camera. Also state the size of largest and smallest screen plate to be used in holder.

It is made in various sizes. Prices as follows:—

		Frames *only*: for Ground Glass.
8 x 10 Size	$15 50	$1 50
10 x 12 "	21 00	1 50
11 x 14 "	26 50	1 88
14 x 17 "	29 00	2 25
17 x 20 "	32 50	2 63
18 x 22 "	36 00	2 63
20 x 24 "	40 75	3 00

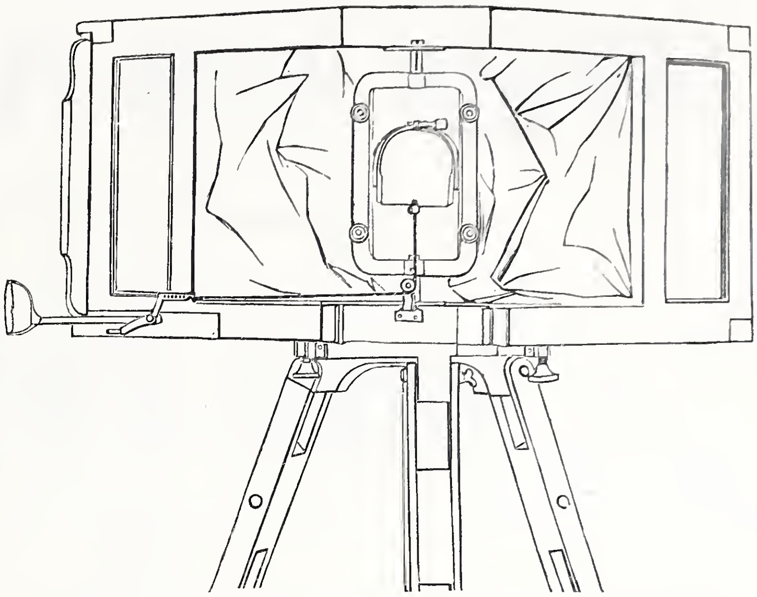
If adjustment from the outside of holder is desired, add $2.00 to above prices.

THE SCOVILL & ADAMS COMPANY,

423 Broome Street, New York City.

THE SCOVILL

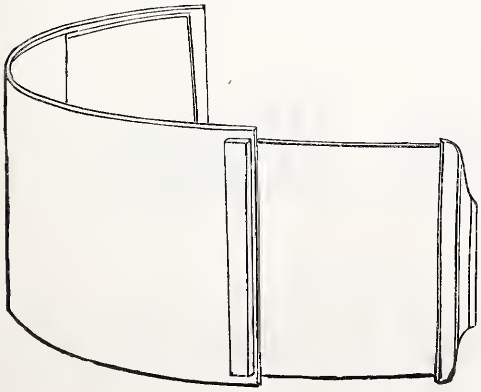
Panoramic Camera.



WE take pleasure in introducing to the photographic fraternity our new Panoramic Camera, which is made in various dimensions up to the size capable of making photographs 18 x 48 inches.

A new design of constructing these cameras in hemispherical form has been invented; a new movement of crossing the lens over the segments of the circle, and an automatic release for the shutter has also been constructed. Carbutt's No. 27 films, or his orthochromatic films of the same sensitiveness, are used by means of an ingeniously constructed flexible dark slide, which permits of the necessary curve to conform with the back of the camera. The cameras are solidly and serviceably made, elegant in finish, and in every way maintain the world-wide reputation of the American Optical Company. The cuts shown herewith give an idea of the external appearance of the camera, and the dark slide for holding the film.

The prices of these cameras, including in each case a substantial wooden box or trunk for holding the instrument, a suitable tripod, a panoramic printing frame, two holders, two developing baths, and the celebrated Swift lens, are given below.



Price of The Scovill Panoramic Outfit for making photographs 10 x 30 inches, complete as above, ...	$250
Price of The Scovill Panoramic Outfit for making photographs 16 x 43 inches, complete as above, ...	300

The Scovill & Adams Company,

423 Broome Street, New York City.

DRESDEN PHOTO-PAPER WORKS

∴ ARE MANUFACTURERS OF ∴

CROSS-SWORDS

TRADE MARK. TRADE MARK.

DRESDEN EXTRA BRILLIANT ALBUMEN PAPER.
DRESDEN SATIN ALBUMEN PAPER.
DRESDEN KOSMOS COLLODION PAPER.
DRESDEN CELLOIDIN PAPER (BEST COLLODION.)
DRESDEN VIGILANT SENSITIZED PAPER.
DRESDEN SATIN SENSITIZED PAPER.

Samples sent to Professionals on Application.

TRADE AGENT FOR COLLODION PAPER:

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24-26 East 13th Street, NEW YORK.

DRESDEN PHOTO-PAPER WORKS,

Office:
621 BROADWAY, NEW YORK.

Factories:
DRESDEN, GERMANY, AND JERSEY CITY, N. J.

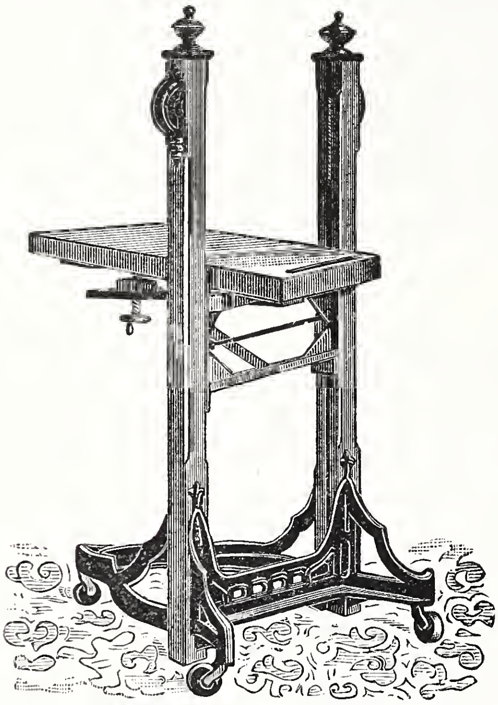
To that select, though
. . . limited class . . .

Who find beauty in any medium which tells the story of the negative fully, yet unobtrusively, and without useless accessories, we appeal.

A Blue Print paper capable of reproducing all the detail of the negative, having brilliant half tones and pure high lights, was unknown before we placed **French Satin Jr.,** on the market. With the introduction of our paper, however, all these desirable features were obtained, and a medium produced on which the finest pictures are easily and quickly made. All the troublesome baths necessary with the silver salts are avoided, and the print produced with a minimum of expense, both in time and labor.

Write for our Booklet. . . .

J. C. Millen,
Sole Manufacturer,
919 and 921 Arch Street, Philadelphia, Pa.



600 PHOTOGRAPHERS

NOW USING

The

Semi-Centennial

Camera
Stand.

THE ONLY ONE THAT GIVES PERFECT SATISFACTION.

DON'T USE ANY OTHER : :
TRY ONE AND BE CONVINCED
THAT IT IS THE BEST MADE.

All Dealers Sell Them. • • •

NEW ENGLAND AGENTS FOR AMERICAN OPTICAL CO'S APPARATUS.

BEST IN THE WORLD
SEND FOR PRICE LIST.

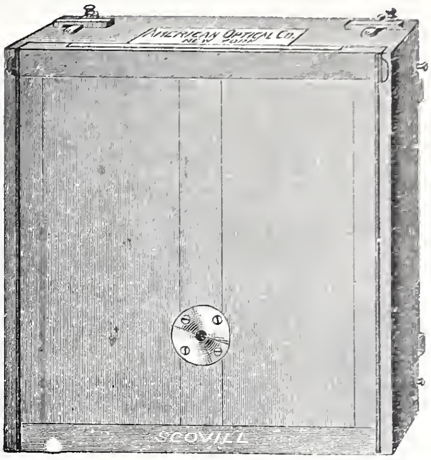
HORGAN, ROBEY & CO.

SOLE AGENTS,

34 Bromfield Street,
BOSTON, MASS.

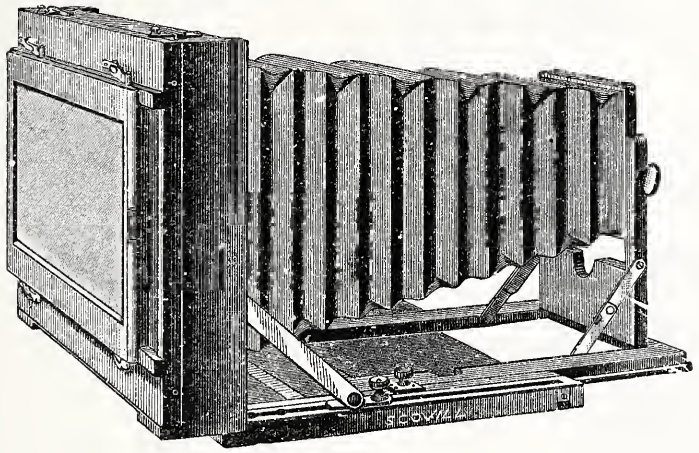
IRVING VIEW CAMERAS.

THE BEST LANDSCAPE CAMERA MADE.


AMERICAN OPTICAL Co. NEW YORK
SCOVILL

The IRVING CAMERA was awarded the highest prize by the judges at the American Institute Fair. They expressed themselves as unable to see how a more complete, compact, light, handsome and serviceable camera could be made.

The IRVING CAMERAS all have swing front in addition to swing back, also vertical shifting front board, and can be focused with either the ordinary Rapid Rectilinear or the Wide-Angle Lenses. They have the Howe patent reversible back, fitted with self-locking ground-glass frame.



One of the best features of the camera is the absence of detachable screws. An idea of this is conveyed by the illustrations showing the camera when extended and when folded.

A superb canvas case, the finest ever made, is supplied with each one of the IRVING VIEW CAMERAS.

Price List is as follows:

	Single Swing.	Double Swing.		Single Swing.	Double Swing.
4x 5 ..	$27.00	$32.00	10x12..	$60.00	$65.00
5x 7 ..	33.00	38.00	11x14..	65.00	70.00
5x 8 ..	35.00	40.00	14x17..	75.00	80.00
6½x8½..	40.00	45.00	17x20..	85.00	90.00
8x10 ..	45.00	50.00	18x22..	95.00	100.00

In order to convey an adequate idea of the lightness of these cameras, it is sufficient to say that the 5x8 size camera, with ground-glass in frame and holder, weighs only 3 lbs.

MANUFACTURED BY THE

AMERICAN OPTICAL CO.

FOR SALE BY ALL DEALERS.

Nepera Paper.

NEPERA CHEMICAL COMPANY
TRADE MARK.

A NEW PRINTING-OUT, READY SENSITIZED PAPER.

IS neither CURLY nor HORNY, neither STICKY nor SOFT, but has a **rubber-like film,** which stands a hot water test of 100 degs. F. and behaves just as well in ice cold water. **NO ALUM** nor special hardening baths which endanger the durability of the image. **NO ICE, NO HOT WATER** treatment, no special negatives required. **PERMANENT PRINTS. A Paper for all climates and all seasons.**

THE ONLY AND PROPER SUBSTITUTE FOR ALBUMEN PAPER.

Gives Mat or Glossy Prints.

Our Bromide Trio.

PLATINOID, NEPERA BROMIDE!	ENAMELED, NEPERA BROMIDE!!	ROUGH SURFACE. NEPERA BROMIDE!!!
Mat surface with Platinum effects. For contact prints and enlargements. Can be toned Sepia. Printed in a few seconds.	Glossy surface. Can be burnished or squeegeed on Ferrotype plates. Resembles Albumen or Aristotype for large portraits.	A thoroughly first-class paper for crayon work, giving good blacks, pure whites and half-tones.

Nepera Bromide Emulsion is made by an improved process, insuring uniformity and rendering its manufacture entirely independent of condition of weather or quality of water.

Ask your dealer for **NEPERA PAPER** and **NEPERA BROMIDE,** if he does not keep them write directly to

NEPERA CHEMICAL CO.
NEPERA PARK, N. Y.

Use NEPERA-METOL-QUINOL CONCENTRATED DEVELOPER for Dry Plates and Bromide Paper.

One 8-oz. bottle will develop about 18 dozen of cabinet prints, - - -	$0 75
In powder, ready for use, to develop about 12 dozen cabinets (including postage), - - - - - - - - - - - -	50

An Entirely New Product.

SENSITIZED

ALBUMA PAPER

CABINETS, - $1.00 PER GROSS.
20 x 24, - - 2.00 PER DOZEN.

OTHER SIZES PROPORTIONATELY.

CABINETS—Postage paid, $1.12 per Gross.
SAMPLE DOZEN—Postage paid, 17c., Cabinet or 4 x 5.

REQUIRES NO ALUM, HARDENING OR SOFTENING SOLUTIONS.
HAS AN ABSOLUTELY INSOLUBLE COATING.
LIES PERFECTLY FLAT AT ALL TIMES.

New York Aristotype Company,

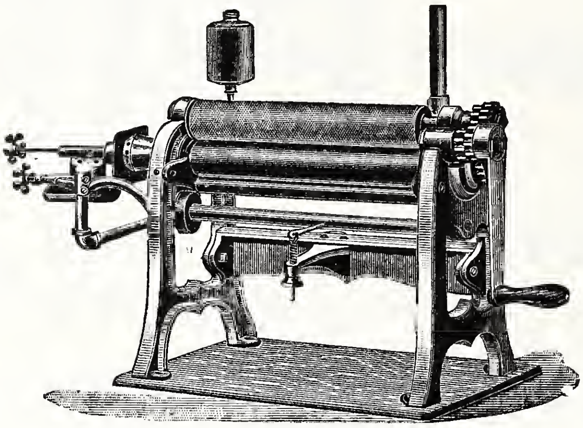
21 QUINCY STREET,
CHICAGO.

BLOOMFIELD,
NEW JERSEY.

The
Latest
In

ACME BURNISHERS

ACME Rotaries, Oil, Gas, Gasoline.
ACME Stationaries, Oil, Gas, Gasoline.



Latest Improved Burnisher on the Market.

HEATS QUICKLY. GIVES A BEAUTIFUL FINISH.

NOTE THE SPECIAL GEAR—Simplicity Itself—Only Hollow Roll Burnisher made which heats with Oil, Gas or Gasoline. Fully Guaranteed.

ASK YOUR DEALER FOR THEM. TAKE NO OTHER.

11 inch Oil, Gas or Gasoline,	$30.00
15 " " " "	40.00
21 " " " "	50.00
26 " " " "	60 00

Special Sizes Made to Order.

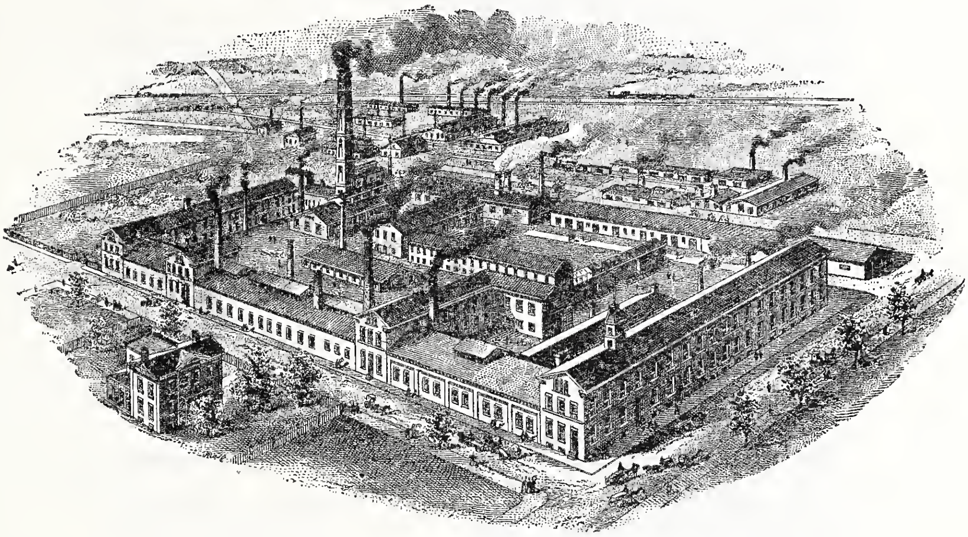
ACME BURNISHER CO., Fulton, N. Y.

CHAS. COOPER & CO.

ESTABLISHED 1857.

Manufacturing Chemists and Importers,

194 WORTH STREET,
NEW YORK.



WORKS AT NEWARK, NEW JERSEY.

Chemically Pure Photo Chemicals.

NITRATE SILVER, CHEMICALLY PURE CHLORIDE GOLD,
SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
: : LITMUS PAPER, ACID SULPHITE SODA SOLUTION,
COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS,
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

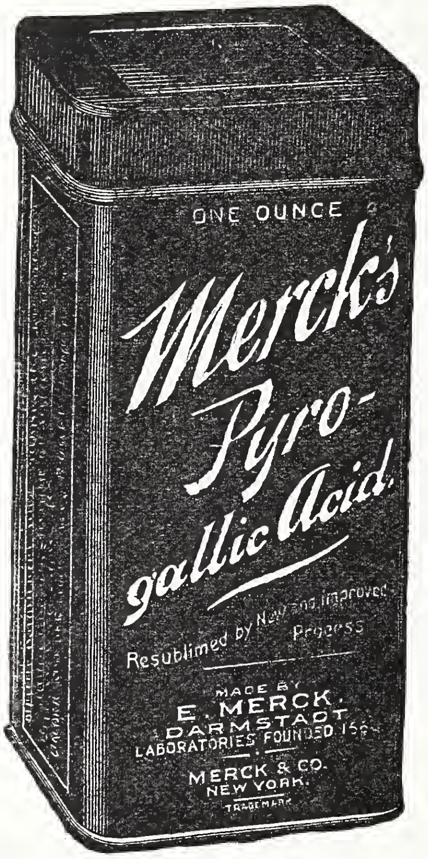
We Manufacture a full line of Chemicals, Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

MONTHLY PRICE LIST ISSUED.

REFINERS OF PHOTO SILVER AND GOLD WASTE.

Merck's Pyrogallic Acid



will be found, upon comparison, to be superior in every respect to all other brands on the market. Its distinctive points of superiority are:

1st.—ABSOLUTE PURITY
2d.—PERFECT CRYSTALLIZATION
3d.—IMMACULATE WHITENESS
4th.—EXTREME LIGHTNESS
5th.—MODERATE COST
(Its price is not higher than that of any other make.)

Merck's Pyrogallic Acid

produces the highest intensity to be desired in a photographic plate, and, at the same time, the finest detail in light and shade required for the most perfect printing negative.

Under ordinary precaution, it retains all its superior qualities undiminished for an indefinite length of time.

☞ WHEN ORDERING SPECIFY **"MERCK'S."**

TO BE HAD OF ALL DEALERS.

Against the Combine Trust and
Dry Plate Manufacturers' Ring.

40 PER CENT. DISCOUNT

- - ON - -

WUESTNER'S REGULAR PLATES.

At the meeting just held in Cleveland, the Dry Plate Manufacturers' Ring devised a new scheme to boycott such Plates as would not submit to Ring dictation, by forcing combine brands of unknown manufacture and inferior quality upon the market, at such large discounts as they hope will lessen the sale of the "**Eagle.**"

We do not believe in such Trusts or Rings; much less will we be dictated to by them. We offer you the Best Plate on the face of the earth—"**The Eagle,**" an Anti-Combine Plate, which you can buy in case lots at **40% Discount from Price List.**

Dozen in Case.	Size.	Regulars. 50 X, & 40 XXX.
39	3¼ x 4¼	$0.45
24	4 x 5	.65
24	4¼ x 5½	.75
28	4¼ x 6½	.90
22	4¾ x 6½	1 00
22	5 x 7	1.10
22	5 x 8	1.25
12	6½ x 8½	1.65
12	7 x 10	2.20
12	8 x 10	2.40
3	10 x 12	3.80
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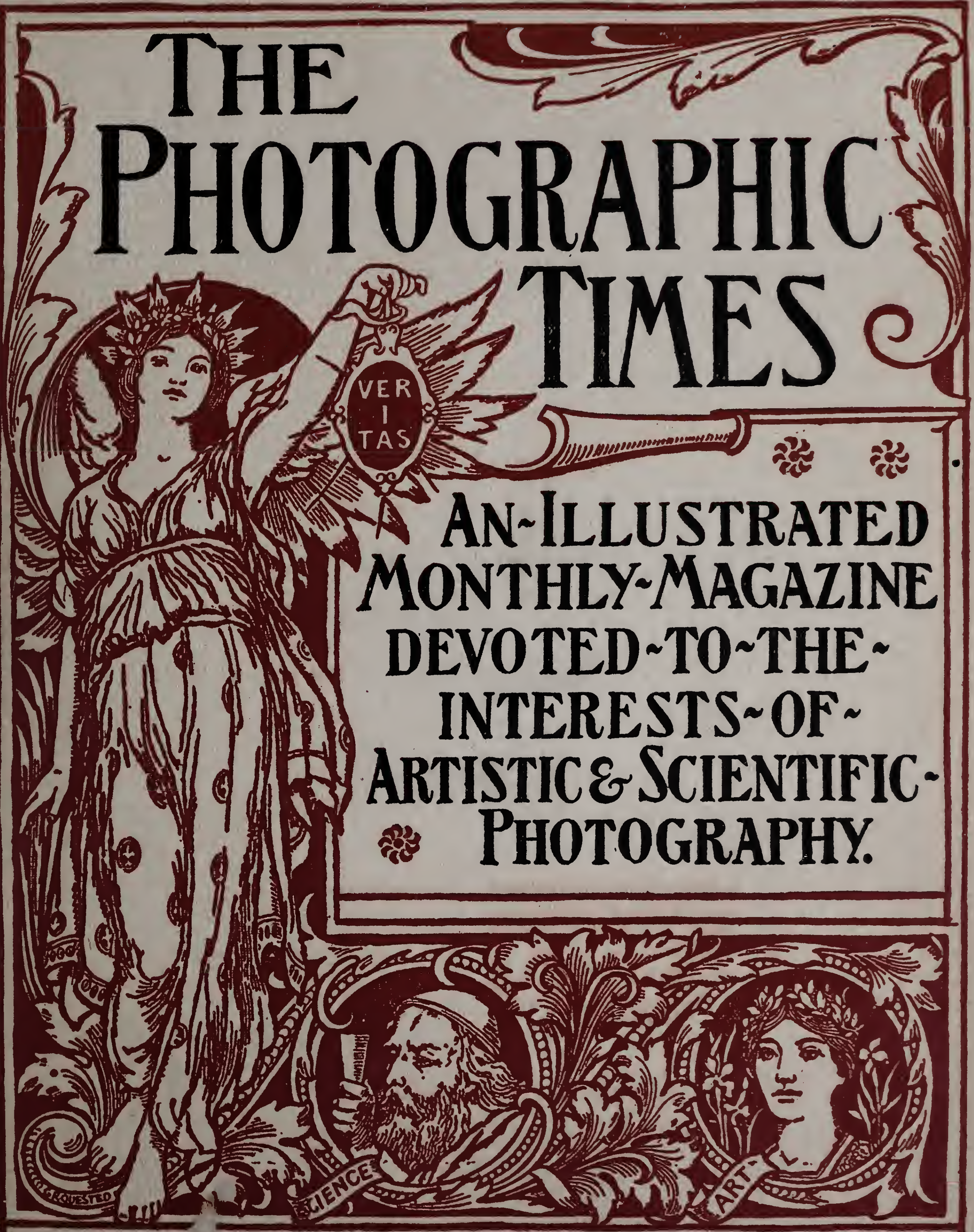

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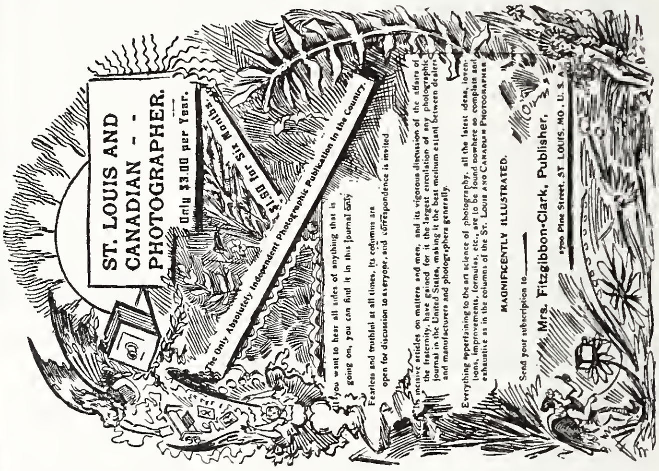

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In my opinion it is the best "Annual" yet issued. I shall value it very highly.—Clinton Ogilvie.

It is a beautiful and valuable work, and reflects the highest credit on your taste, and skill, and enterprise.—W. J. Hickmott.

From the cursory examination I have been able to give it thus far, it seems not only beautifully gotten up, but also filled with most useful and timely information.—B. J. Falk.

I have thought from year to year that the limits of excellence had been reached; but each succeeding year I find a handsomer book than any before, and a greater supply of material between the covers.—Sam. W. Very.

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3	*6* ....

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Signature, ...

THE PHOTOGRAPHIC TIMES.

Vol. XXVI. MARCH, 1895. No. 3.

PHOTOGRAPHY AND THE DETECTION OF CRIME.

DURING the last few years, or, rather, since the introduction of the dry-plate process, photography has been seized upon by the workers in the various arts and sciences as a valuable and indispensable assistant. We know how it helps the astronomer, the chemist, the botanist, the artist, and many others, but, unfortunately, it exercises no discrimination in the rendering of its services and aid. The forger of bank notes has no more valuable an assistant than photography, for by its means he is able to reproduce the most intricate design. But with an equal readiness it aids justice in the detection of the forger and the criminal. Many interesting cases have happened in the annals of crime in this and other countries where photography has played a most unexpected and important part. We do not, of course, refer to the absurd stories which are so repeatedly told of the image of a murderer being found in his victim's eye, as these are but the fruits of the imagination of needy reporters and editors of sensational papers.

In an interview with a writer in *Demorest's Magazine*, Mr. George G. Rockwood, the well-known New York photographer, gave some interesting information regarding his experience in this branch of photography.

"It is now a number of years," said Mr. Rockwood, "since I first began to use the camera for the purpose of assisting in the furtherance of justice. Since then photography has become a well-nigh indispensable adjunct of the police department, and every well-equipped bureau possesses its own facilities in this line.

"The principal reason of the camera's usefulness in this direction is its unfailing accuracy. A photograph has come to be looked upon as an unquestionable fac-simile of whatever it purports to represent, and the question of authenticity is thus at once established beyond any questioning when a photograph is brought into evidence. The camera has earned itself the distinction of being considered an unimpeachable witness. The next most important faculty about the camera is its power of penetrating beyond the limits of human vision, and, what is almost equally important, photography is not color blind, but detects many things that should legitimately be within the range of ordinary eyesight were there such a thing in existence as a perfect human eye.

"You will doubtless remember the saying of Helmholtz, or was it Meyer? I forget which but one of them, I know, that should a mechanic send him such an imperfect piece of mechanism as the human eye he would return it for repairs. The eye is, of course, a wonderful organ; for notwithstanding its generally defective condition, it is the most marvelously perfect lens conceivable. It has that quality which scientists have in vain tried to secure in me-

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chanical optics, a universal focus, and instantly adapts itself to all conditions of light or distance. But the fact is, the eye is a very much abused member, its principal defects arising from its use with either too feeble or too strong illumination. I merely mention this fact about the eye to show you the unreliability of the evidence which it often furnishes us, in comparison with the comparatively infallible results obtained from the camera.

"The eye will sometimes fail, even with the highest magnifying powers, to see fine shades or tints of color such as often exist in old manuscripts and documents. Inks will apparently fade out and so blend with the yellow tints with which time stains old paper that the lines are lost to the eye. But a faint difference does exist, which the camera will elucidate. The skillful photographer will, by chemical treatment of his negative, intensify the slight differences to such a degree that when the ordinary autograph, or signature, is enlarged to, say, three or four feet in length, the image is rendered very strong and unmistakable. It is the same in case of tracings or forgery. I recently made such an enlargement from a suspected autograph, and the experts instantly decided that the paper was a forgery. In fact, it is now questionable whether the counsel will even permit the case to go into court.

"To make this statement clearer it is necessary to state briefly that light and color have a visual and active, or chemical, value quite distinct from each other; that is to say, colors that would appear to have a certain monochromatic value to the eye, in the scale from black to white, give entirely different results or effects to the photographic sensitive plate. For instance, a fair shade of blue or yellow, one would say, would be the equivalent of a neutral gray in the monochromatic (black to white) scale of color. To the photographic plate the two colors named would be interpreted in a surprisingly opposite value. The blue would be nearly white, while the yellow would appear nearly black. It is the blending of these tonal colors in the pigments used in oil paintings which often presents such strange, apparent distortions in the photographic reproductions of famous works of art. The painting which is smooth, charming, and harmonious to the natural eye, is made to appear in grotesque crudeness by the presence in the shadows of warm or cool pigments blended with ever so much skill. The chemist has supplied the photographic processes with certain substances which make the sensitive plate alive to single colors, but where these contrasting elements are in close juxtaposition, the interpretation of both colors in equal degree is yet unattained to our fullest desires.

"Photography became such a successful counterfeiter of black-and-white drawings, engravings, etc., that it is now some years since methods were sought to thwart the evil-disposed in this direction, and the use of color was adopted to overcome the difficulty. I think it is now some fifteen years since a representative of one of the great bank note engraving companies called on me for suggestions in this line, and I made a series of experiments in photographing colors with a view to show how each color and its tint was interpreted by the camera. A drawing-board about twenty-four inches square was divided like a checker-board, and all the colors, with their tints and many combinations, were carefully drawn on it in water-colors, each small square being covered with a color. The blues, yellows and reds were put in parallel columns, with their primary, or nearest possible simple color, and with as nearly equal visual value as possible. The results were surprising, and valuable in regard to the counterfeiting of bonds, checks, and bank notes. Colors were introduced which made it then and now impossible to photograph them. To give a simple illustration: if a blue ink were used on a yellow-toned paper, the blue would come light drab, and the yellow would appear black. If the blue were blended with any of the non-actinic colors, such as red, yellow, or their tints, but a faint image could be reproduced, and one not possible to reproduce in a printing plate. In one series of bank notes a word was first printed in orange color on the paper, and upon it were superimposed various colors, designs and tints, which completely obscured the first word printed; one of these plates was placed before the camera, and when I developed the plate, reaching almost across the bill, appeared, in large, distinct characters, the word 'COUNTERFEIT.'

"One of the most interesting practical illustrations of the uses of photography in the developing of an absolutely invisible autograph, is given in the final litigation of the now well-known Stubblefield-Munford controversy, which was in the Ohio courts for three-quarters of a century. It concerned a deed of land to the

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amount of fifteen hundred acres, to which there were five heirs, the signature of five persons being necessary to make the document valid. During President Monroe's administration this tract was willed by one of the old Munfords to his five heirs, and the suit was brought in the deed of sale signed by them. They, in turn, deeded the land to Stubblefield, who afterward sold parts of it to different parties, who have had to pay twice for their land by decision of the court. This was due to the absence of the signature of Anna Munford, one of the five heirs to the original deed to the Stubblefields. The paper when produced in court was yellow with age, and all the writing was dim, though legible, except as to one name. There were four signatures, but no trace of a fifth, though there was an apparently blank space where it might have stood. None of the microscopes in common use by experts disclosed a line of any signature where it should have appeared. Under these circumstances the aid of photography was invoked. The photographic copy was taken with the greatest care by an expert. It was then enlarged ten times, when the missing signature became visible! The minute scattering stains of ink, which had faded so as to be invisible by ordinary methods, became perceptible, and assumed regular order in the enlarged photograph, establishing the validity of the deed, and reversing all previous decisions.

"What I have just stated confirms, very strongly, my point that the camera sees things invisible to the natural eye, and that an enlarged photographic picture will not only show erasures and alterations, but, so to speak, resurrect a dead signature!

"In the discussion of serious questions in art or science, there often crops up a grotesque element. Such we may call the detective camera, with the aid of which till-tappers and thieves are now being surprised. What can be more realistic and conclusive than a photograph of a thief or burglar in the very act of his crime? A case of this kind, one of a number that have been reported, occurred in Grand Rapids, Michigan, and was brought before Judge Haggerty of the Criminal Court in that city. The details were as follows: For some time the cashier of a large store had been aware that the cash drawer was being robbed. Investigation showed that while the night watchman was making his rounds several boys known to him had been in the habit of entering the store, and suspicion fastened upon the boys. It was then that the

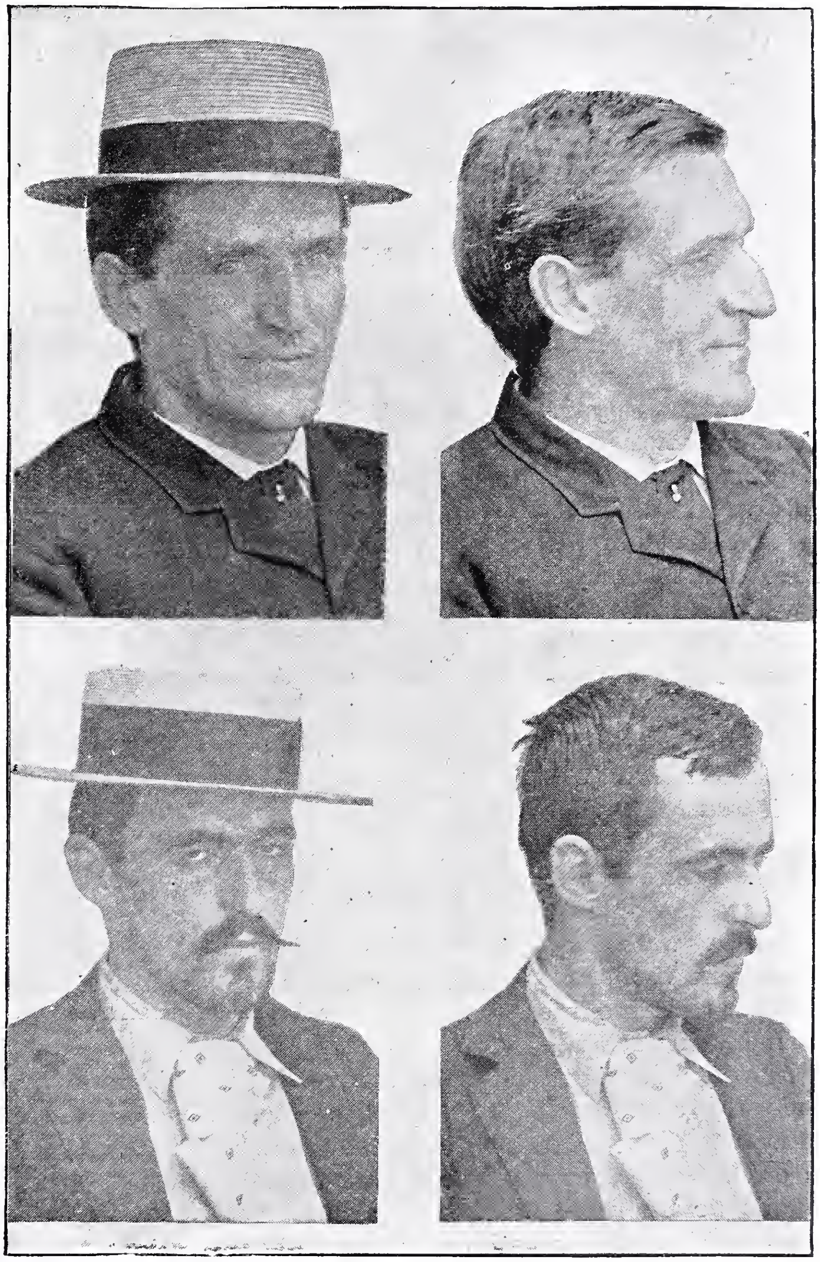


FIG. 1.—PHOTOGRAPH TAKEN BY THE BERTILLON SYSTEM.

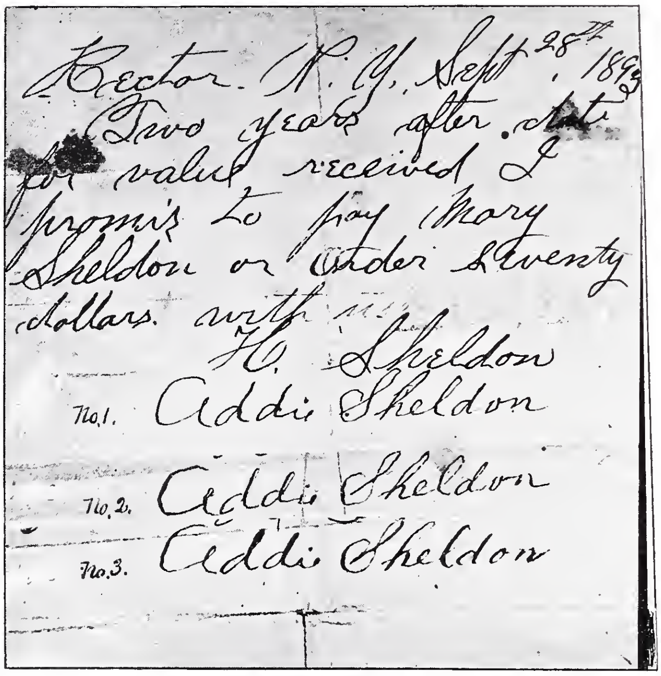
photographic scheme was conceived and put into execution. Three boys were arrested as a result of the camera's evidence, and at first the accused youngsters vigorously denied any knowledge of the crime; but being confronted with the photographs which showed them in the very act, the culprits broke down and made a full confession. The camera had been placed in a position covering the desk and till in the office, and electric communication made with the Edison Company's plant to operate the device. A burglar alarm was fitted in the cash drawer, so that when the till opened the electric connection was made and the shutter of the camera operated, exposing the lens, and at the same instant setting off a flash-light.

"I must also mention the service which the camera is frequently called upon to render the police in connection with mysterious cases where every tittle of evidence is indispensable to their purposes in elucidating the facts of the case. For instance, I have frequently been called upon to make photographs of footprints, which a few hours' delay would have left indistinguishable and useless for the purpose of evidence. Sometimes there are finger-marks on doors or walls to be treated in the same manner; and it is quite common in murder cases where suspicious circumstances exist, to have the scene of the tragedy photographed as soon as possible after it has been discovered, in order to preserve a record of the minutest details before anything has been disturbed. This was done, I believe, in the celebrated Borden case, at Fall River; and it is quite a usual course for the police to take, where there is cause to believe the photographs will prove useful. A bare allusion to the use which the keepers of the various morgues throughout the country have made of the art of photography will be sufficient to suggest some gruesome results from the omnipresent camera."

In all prisons accurate portraits are made of criminals. Artistic poses are not attempted and the retoucher is not required. The method usually employed is that known as the Bertillon system. A full face portrait is first made with the hat on, and afterwards a profile image without the head gear is taken. (See Fig. 1.)

Mr. D. T. Ames, who is well-known as one of the best handwriting experts in this country, and editor of an interesting magazine devoted to the art of penmanship, acknowledges his indebtedness to the camera in solving many puzzles presented to him in the shape of alleged forged signatures.

Mr. Ames has been kind enough to send us one of these, which we reproduce herewith (see Fig. 2). Regarding it he says:



Rector N. Y. Sept 28th, 1893
Two years after date
for value received I
promis to pay Mary
Sheldon or order Seventy
dollars with use
H. Sheldon
No. 1. Addie Sheldon
No. 2. Addie Sheldon
No. 3. Addie Sheldon

FIG. 2.—PHOTOGRAPHIC COMPARISON BETWEEN GENUINE AND FORGED SIGNATURES.

"It appeared from the evidence introduced at the trial that, some time in the early part of '93, a Mr. H. Sheldon died in the town of Rector, N. Y., leaving a bankrupt estate. His wife, Addie Sheldon, had for some years conducted a small country store on her own account, and had saved quite a little fortune. A certain party held three notes against her husband, and, after his death, sought to collect them from her as the executrix of his estate. One of the notes being presented to her, in the consideration of which she was an interested party, she signed her name below his; she was notified that there were two other notes made by him which were not produced, but she at once disclaimed any intention of paying the other two, as she had had no interest whatever in their consideration.

"Shortly after a suit was brought for the collection of the two repudiated notes, aggregating, their principals and interest, to nearly $800. When presented, they bore the alleged signature of Addie Sheldon. Upon comparison by the writer of the alleged signatures upon the two notes with the genuine signature of

Addie Sheldon, it was apparent that the signatures upon the notes were fabrications. At the opening of the trial, the note bearing the genuine signature of Addie Sheldon, marked upon the photograph No. 1, which had been hitherto withheld by the holder, was ordered to be produced in court. When, upon comparison with the two in the suit, that was found to be the original from which the other two had been produced as tracings. They are marked Nos. 2 and 3 upon the photograph.

"Photographs were made in order that they might be passed to the jury, while the writer explained the evidences of the forgery.

"First, by comparing Nos. 2 and 3 with No. 1 to show that they were forged reproductions, and also comparing Nos. 2 and 3 with the genuine signature of Addie Sheldon, shown upon another photograph, to show their unlikeness to those upon the notes. By placing the photographs in the hands of the jury, they were enabled to follow the analysis and explanation of the writing as given by the expert, thus enabling them to form their own opinion upon the facts that he pointed out rather than excepting his mere opinion that the signatures Nos. 2 and 3 were forgeries.

"This is one method in which photographs are used as illustrations on forgeries in a court room. Another is by taking, for instance, the group Nos. 1, 2 and 3 and enlarging them by solar prints to mammoth size, say thirty-six or more inches in length, and then by placing these cartoons before the jury, point out the various evidences for or against the genuineness of the signatures or writing that is brought in question.

"It will at once be apparent that photographs are thus made to answer a very important purpose, in presenting evidences of genuineness, or otherwise, of writing that is so frequently in question in our courts of justice."

"Another characteristic of forged handwriting which the camera discloses is the failure in retouching to cover the surface thoroughly with the ink as would be done in natural writing. The letter J (see Fig. 3) which you see is a fair sample of what I mean; and it comes up very conspicuously with its tell-tale defects in a photomicrograph. All really scientific examinations of handwriting are based upon the well-known fact that the handwriting of every adult must inevitably have multitudinous distinctions and habitual peculiarities. Of many of these the writer is himself unconscious; such as initial and terminal lines, forms and methods of

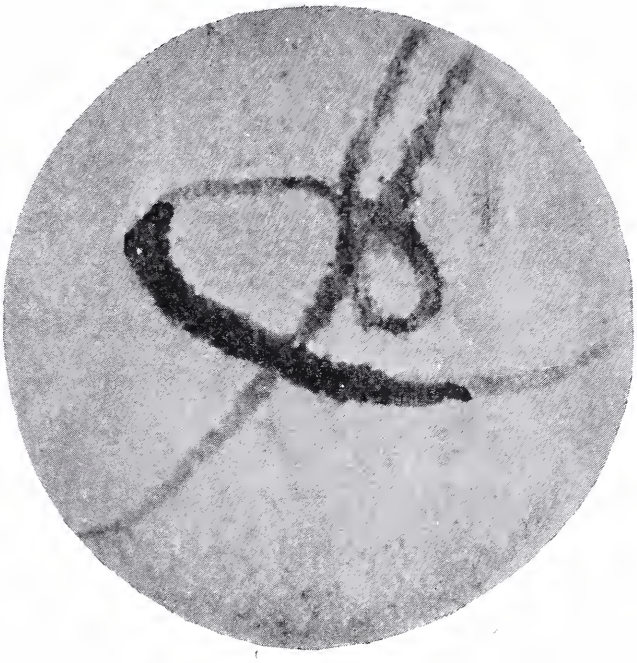


FIG. 3.—A PHOTOMICROGRAPH OF THE LETTER J.

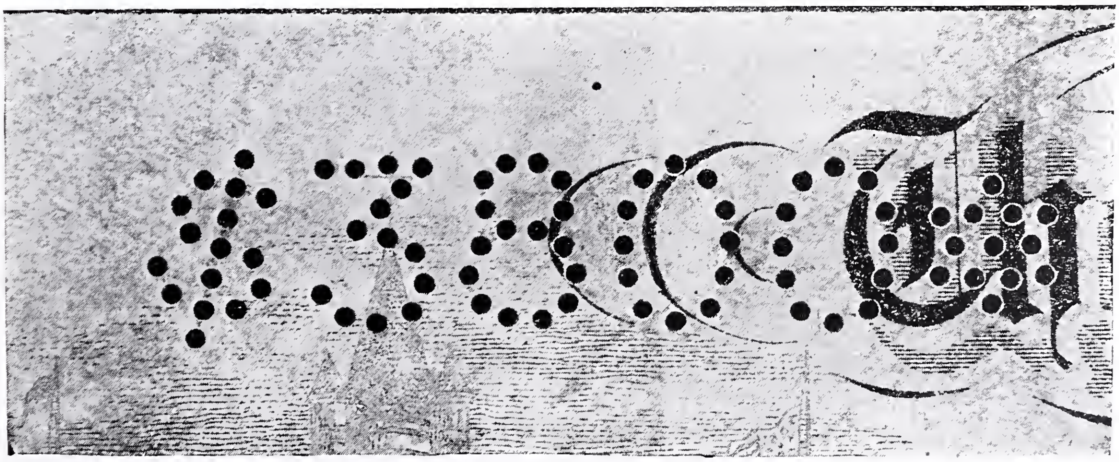


FIG. 4.—PHOTOMICROGRAPH SHOWING ALTERATION MADE IN THE AMOUNT OF A CHEQUE.

constructing letters, combinations, relative proportions, turns, angles, spacing, slope, shading (in place and degree), crosses, dots, orthography, punctuation, etc. These peculiarities are the outgrowth of long habit, and come at length to be produced and reproduced by the sheer force of habit, as it were, automatically by the hand, its movements being independent of any direct thought or mental guidance. Being thus unconsciously produced, and in the main unnoted by the writer, they cannot be successfully avoided or simulated through any extended piece of writing. To do so a writer would be required to avoid that of which he was not conscious in his own writing, and to copy the undiscovered habits of another writer."

Mr. Frank Davey, who is another photographer who makes a specialty of this curious branch of photography, gives in *The Traveller* an excellent example of its utility. He says:

"It is astonishing the number of uses to which photography has been put, oftentimes with marvelous results. For instance, the principal protection banks have in paying out money is the perforation of the amount the check calls for. It is very easy for the forger to erase the amount that is in writing, and not leave a noticeable trace to the eye; but it always leaves a light yellow stain that may be so delicate that the microscope cannot detect it, and yet photography will register the delicate color.

"A check was brought to me that had been raised from thirty-eight dollars to three thousand eight hundred, and the experts were not sure how the change had been made. I enlarged the check, which showed that the forger had cut the star out and filled the hole with paper of the same make, then perforated two ciphers and a star, increasing the amount considerably. (See Fig. 4.) The work was done by a skilled man, and so cleverly matched that the joint could scarcely be seen under the microscope. The enlarged photograph showed the patch very plainly, proving that the perforation is no longer a protection when in the hands of a skilled forger."

In conclusion we will again quote from the excellent article on the subject published in a recent issue of *Demorest's Family Magazine*, written by Mr. Leslie Kane, and in which he deals with the work of Dr. Jeserich, who made such a sensation a few years ago, at the exhibition of the Royal Photographic Society, by his exhibit of curious photographs relating to crimes. Mr. Kane says:

"Dr. Jeserich, the well-known German authority on these matters, can, with the assistance of the camera, throw a flood of light on the darkest criminal cases which come under his notice at times. He is an enthusiast over the results obtained by photography and photomicrography in the detection of crime. In a case which this noted photomicroscopist had before him for examination, the fate of an individual suspected of murder apparently rested on the verdict he should render with regard to the character of a particular hair which had been found upon the person of his supposed victim. The hair in question was sent to Dr. Jeserich from Westphalia, and belonged to a man already gray, who was suspected of having murdered a young girl, on whose body a small white hair had been found, which was supposed to have fallen from the beard of the murderer.

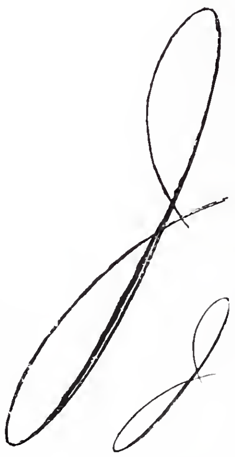


FIG. 5.—ENLARGEMENT OF RETOUCHED LETTER. A RETOUCHED LETTER.

"A photomicrograph of the hair was taken and showed a certain similarity to that of the hair found on the body. The pith of the hairs was strikingly similar, and also the structure of the surface; but at the same time the hairs could not be described as identical. Under great magnification it was subsequently demonstrated that the pith of the hair found on the body extended to nearly the whole width of the shaft, proving it to be animal instead of human, and it was pronounced to resemble that of a dog more nearly than that of any other animal. Closer analysis succeeded in determining that it belonged to a yellow dog that was growing old; its circular section and smooth shape betrayed the fact that it belonged to a smooth-haired dog; the point, which had not been cut off, finally showing that the dog had never enjoyed the luxury of having its hair clipped. The dog was described as follows by the police: 'An old, yellow, unshaven, smooth, and comparatively short-haired dog.'

"Upon this evidence the first prisoner was liberated, and some time afterward suspicion lighted upon another person in the vicinity. Inquiries were made, and it was discovered that at the time the murder was committed this man had owned a dog whose description tallied exactly with that given by the photo-microscopist. A hair from the body of the dog was examined, and proved to be identical with the one taken from the girl's body. The accused subsequently confessed his crime, and was duly executed for the offence.

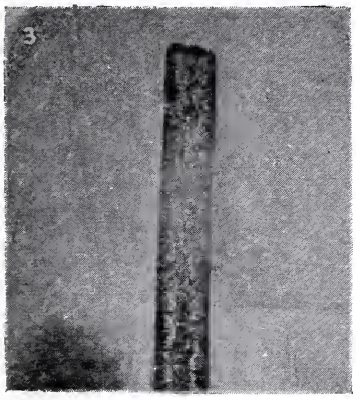


FIG. 6.—RE-GROWN POINT OF A HUMAN HAIR THAT HAS BEEN CUT.

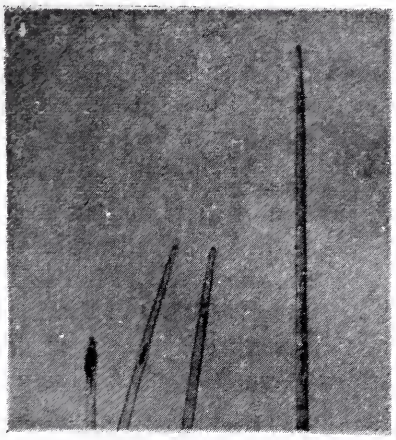


FIG. 7.—UNCUT POINTS OF HUMAN HAIR.

"One of the accompanying illustrations is a reproduction of the re-grown point of a human hair that has been cut; and is given to show that it is easy to distinguish when hair has never been cut. The rounded termination which forms on the cut end, caused by the growth of the central portion of the hair, indicates this fact very conspicuously. The next illustration shows the fine uncut points of a woman's hair that was used in another criminal case upon which Dr. Jeserich was employed. The hair not being magnified so much, yet furnishes an opportunity for comparing the different points specified. This case was also one of murder, having a woman for the victim.

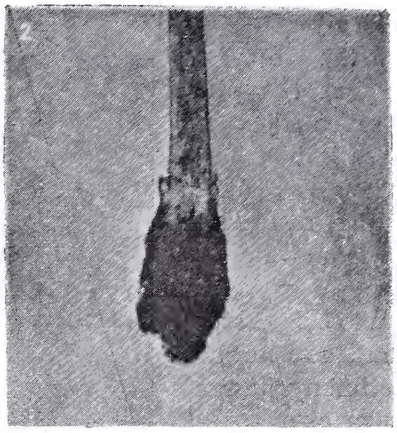


FIG. 8.—CLUB-LIKE ROOT OF HUMAN HAIR.

"The clothing of two men, arrested in connection with this crime, was examined, and hairs were found upon both of them supposed to be from the head of the victim. Those found on one of the men, after being examined under a microscope, however, were proved to belong to a woman whose hair had never been cut, while those found upon the other corresponded exactly with those taken from the murdered woman's head. To further strengthen the evidence, the roots of both hairs were examined, the photograph showing how the root of that found on the second man appeared, being officially described as having a 'well-defined club-like shape,' while those taken from the clothes of the first and wrongly suspected man showed essentially different characteristics, the roots not being in the least swollen or club-shaped. It was ultimately proved that the hair found on the second suspect was from the head of the murdered woman. Previous to his execution the man who was convicted on this evidence also made a full confession of his crime.

"One of the most important of all the microscopical and photographic analyses in connection with crime deals with the differentiations of the various kinds of blood stains. Comparative tests easily prove the fact as to whether the corpuscles are of human or other origin, those of the human being $\frac{12}{10000}$ larger in diameter than those of a dog, the next largest in the scale. As the minutest difference in these measurements can be readily shown by photography, demonstration becomes comparatively easy.

"In the case of a murderer on whose axe stains of blood had been found, it was stated that the accused had killed a goat eight days prior to his arrest. Human blood was nevertheless found upon the axe, demonstrated beyond a doubt by comparison with goat's blood. The man also denied having wiped the axe after using it; but the photograph revealed quite clearly that it had been wiped after the operation. The streaks, running from top to bottom, were clearly shown on the bright steel surface, and as corroborative testimony human hairs were also found upon the axe, which fact resulted in establishing the prisoner's guilt.

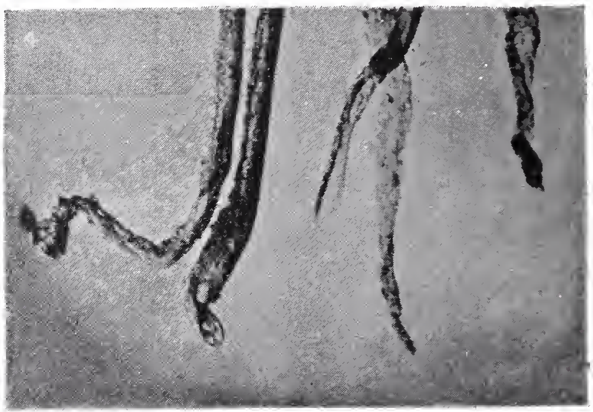


FIG 9.—CHARACTERISTIC ROOTS OF HUMAN HAIR.

"A case in which suspicion was averted by means of the camera is also reported by Dr. Jeserich. Near the scene of a murder, a part of the cover of a vulcanite match-box was found, with scratches upon it, partly worn off, suggestive of lettering. The box was found beside the dead body of a forester in a wood, and as a man named Graeber was suspected of having killed the victim, it was expected that the letters under enlargement would reveal his name on the box, and form substantial circumstantial evidence of his guilt. Dr. Jeserich proceeded to powder the box with fine lycopodium, after which he wiped it carefully so that the few unerased scratches showed clearly. The name on it was shown to be Langer, and a person of that name acknowledged to having droped it near the place some weeks before the crime was committed. Graeber, consequently, was allowed to go free." With the many improvements that are being made in photomicrography and in orthochromatic photography there is little doubt that the value of our art in the detection of crime will continue to advance, and the criminal will eventually learn to dread the camera as much as the sight of a police station.

* * *

THE ADDITION OF FOREIGN SUBSTANCES TO EMULSIONS.

BY R. E. VAN GIESON, M.D.

A PURE bromo-silver emulsion contains only bromide of silver, iodide of silver, a larger or smaller proportion of bromide of potassium and ammonium and gelatine. Any other substances than these may be called foreign, as they are not essential to a normal emulsion. Their number is very large, and experience has proved that their utility is doubtful, except in the manufacture of orthochromatic plates, where the addition of coloring matter is essential to make the film more sensitive to certain colors of the spectrum.

Additions of foreign substances to the emulsion have been made chiefly for three purposes:

1st. To make the emulsion more sensitive.

2d. To prevent fog.

3d. To increase the resistance of the gelatine and prevent frilling,

Further, these additions may be made during emulsification, or after the emulsion is finished.

It will be seen, then, that this subject cannot be exhaustively considered in the limits of an ordinary article, and only such substances will be studied as have been extensively used and recommended, while others of less importance will be simply referred to.

Alcohol.—This addition is chiefly used in the ammonio-silver process. Five to ten per cent. of alcohol added to the gelatine solution produces a very fine silver bromide, but if much gelatine is present delays ripening and lowers the sensitiveness. It also prevents the solution of the silver bromide in the ammonia.

Alcohol has been chiefly used in the Henderson cold process, where from seventy to eighty per cent. has been added. This process is practically obsolete and the claims of enormous sensitiveness by the use of alcohol in a very dilute gelatine solution have not been satisfactorily proven. Alcohol in the cooked emulsion decreases sensitiveness.

Glycerine, in the ammonio-silver process, makes a clear emulsion, but diminishes sensitiveness.

Gum Arabic.—In 1870 to 1880 patents were obtained for emulsions consisting wholly of gum arabic. Eder has obtained clear working emulsions with gum arabic, but they gave thin, weak negatives and were insensitive. A slight addition to the gelatine emulsion before washing does not lower sensitiveness, and is said to diminish the danger of white spots. I have used gum arabic with the idea of preventing streaks and cloud markings upon the plate; a large number of experiments led to a negative result.

Starch.—An emulsion can be made with starch alone. It has no practical value. I have used starch for the same purpose as gum arabic, also with entirely negative results.

Casein.—Alkaline solutions dissolve casein and emulsions have been made of it by Bartlett. The sensitiveness is very slight.

Albumin has been successfully used as a substitute for gelatine, for which Farmer & Tompkins, of London, obtained a patent. It has not come into extensive use.

Agar-Agar, a vegetable glue, which has a very powerful and firm quality of setting, has been added to the emulsion with a view of making the film more resistant. One per cent. makes a very firm and resistant film, but the emulsion separates, the agar-agar precipitating in small lumps. The results have not been satisfactory.

Acids.—All acids prevent fog forming during the cooking of emulsions, when added during the mixing. The vegetable acids are less likely to delay ripening and lower sensitiveness than the mineral acids. The best of these is acetic acid. The mineral acids act very energetically, and but small quantities can be used. A very faint acid reaction is all that is necessary. More than this defeats the object of the cooking by decreasing sensitiveness.

Peroxide of Hydrogen.—A few drops added to the emulsion before cooking keeps it very clear, without lowering sensitiveness. It is an efficient substitute for acids.

Bichromate of Potassium is a very strong agent for reducing sensitiveness, to such an extent that plates can be prepared by daylight. No practical use has been made of the fact.

Additions to the finished emulsion:

Bromide of Potassium or Ammonium.—The washed emulsion usually contains more or less of these salts depending upon the thoroughness of the washing. As is well known, they retard development, and are the standard regulators of this part of the process. A small quantity in the emulsion retards development without materially diminishing sensitiveness. Hard and glassy working emulsions are always injured by the addition of bromide salts. Those that are inclined to fog with normal developer are invariably improved by slight additions.

Emulsions containing traces of bromide salts keep better than where the washing has been very thorough.

A gelatine emulsion preserved in alcohol containing ammonium bromide can be kept indefinitely, and works clearer after keeping than when first made. I have kept emulsions in this way for two years. After rewashing their sensitiveness was equal to that of the fresh emulsion, and the clearness and development of the shadows better.

Sodium Carbonate.—A washed emulsion made slightly alkaline by this agent is increased in sensitiveness. Ten grains to a quart of emulsion can be added without materially injuring the gelatine. Much more than this makes the film less resistant and produces frilling. The fixed alkalies produce the same effect in a greater degree.

Glycerine, Sugar, Gum Arabic, Dextrin, are added to the washed emulsion to hasten development, in the proportion of five to ten per cent. Their usefulness is doubtful.

Albumin has been chiefly recommended by Obernetter and Spink, who assert that, properly added, it produces a clear and spotless film. Emulsions which gave dull spots, growing dark under the action of the developer, are said to work clear when albumin is added. Eder, after thorough experiments, does not recommend it.

Soap, Oxgall has been added to the finished emulsion for the purpose of removing fat stains.

Resin, Shellack in alcoholic solution has been added for the purpose of increasing the resistance of the film. Sensitiveness is not affected. The film has a mat surface and adheres tenaciously to the glass. The whole emulsion must be alcoholic. For this reason the process has found no practical application.

Alum and Chrome Alum are chiefly used to harden the gelatine. Alum also prevents decomposition of the gelatine. Formerly more or less chrome alum was almost a constant addition by the plate makers. At present it is less used. An excess of alum certainly diminishes sensitiveness and prolongs development. A grain of common alum added to an emulsion containing twenty grains gelatine to the ounce raises the setting-point one or two degrees Centigrade, which does not prevent the emulsion from working readily. Double this quantity raises the setting-point nearly five degrees Centigrade and causes the emulsion to flow so thick that coating the plates is difficult. Chrome alum added in the same proportions acts more energetically, and after the emulsion has set cannot be again made liquid, except by the use of a dangerously high temperature, 60 to 65 deg. C. My own experiments convince me that alum added to the emulsion increases the liability to the formation of streaks and irregular markings on the dried plate. Eder recommends the following mixture :

Water	50 parts
Alum	4 parts
Glycerine	4 parts

To about three ounces emulsion five to fifteen drops can be added without danger of making the emulsion too thick to work. From all of which it appears that alum, though useful, must be added cautiously, and only to that portion of the emulsion which is to be immediately used. The amount having been determined by experiment, the main bulk of the emulsion is reserved and the precise quantity added after melting and just before coating the plates. This applies, of course, to pouring the plates by hand. In machine coating alum is only exceptionally used and in very small quantities, as an easy-flowing emulsion is a necessity in this process.

Pyrogallol.—This substance, much used to increase the sensitiveness of the collodion plate, has been used for the same purpose by Barton Jones. Experience has proved that it is useless as a sensitizer. It hardens the film and increases resistance. Plates have been coated with sodium sulphite and pyrogallol in the emulsion and after exposure developed with a simple soda solution. The durability of such plates is slight, and the practice belongs chiefly to the domain of interesting experiments.

Gallic acid, very useful as an intensifier in the collodion process, is of no advantage as an addition to emulsions.

Tannin, employed to harden the film, cannot be used with safety. Both these substances produce fog when added to alkaline emulsions.

Hydrochinon, used in the same manner as pyrogallol, gives a more durable plate. Biering's experiments prove that such plates can be kept at least a year.

Acids, mineral and vegetable, are not added to the washed emulsion.

Bromine, *Iodine*, in alcohol 1:200, remove slight fog and reduce sensitiveness. Iodine alcohol solution is less effectual than bromine solution. The reason is easily explained. The free bromine converts the silver sub-bromide into silver bromide, which is more sensitive than silver iodide.

Potassium Bichromate diminishes sensitiveness enormously.

Alcohol has been added in small quantities to hasten the drying of the plate. Five per cent. is the usual quantity. It certainly makes the plate dry more rapidly, but produces all sorts of strange blemishes on the film.

Salicylic acid, *benzoic acid*, *quinine*, *thymol*, *carbolic acid*, *resorcin*, have been added to prevent decomposition. Of these the best is carbolic acid, five drops dissolved in a small quantity of alcohol to two ounces of emulsion. Practically antiseptics of this kind are of no great value. An emulsion when made should be immediately used up.

The addition of vegetable or aniline colors has opened up a new field and given us orthochromatic plates which enable us to get true color values in the finished photograph.

In conclusion we would say to the amateur emulsion maker, except as a matter of experiment, make no additions to the finished emulsion. A normal bromo-silver emulsion always gives the best results. An emulsion that needs fog-clearing additions or something to prevent frilling has not been properly made, or the materials have not been pure—such an emulsion is better thrown away.

THE INFLUENCE OF HEAT ON PHOTOGRAPHY.

BY P. C. DUCHOCHOIS.

THE influence of heat is seldom taken into account by the majority of photographers. It is, however, of great importance, especially at this season of the year.

Not only does cold retard the formation of the latent image, but it also impairs the developing action, as Prof. John W. Draper demonstrated in 1859 at a meeting of the *American Photographical Society*, of which he was then the president.

Thus: if before exposure a photographic film is gradually heated and exposed while warm, its sensitiveness is increased, and even persists for a certain period, although diminished, if the plate is allowed to cool down.

When a developing solution is heated, the development proceeds more rapidly, and the negative shows more details but less intensity, which, however, can be easily obtained by increasing the dose of pyrogallol when the details are plainly visible.

Hence, in case of short exposures, or of prolonged developments, it is advantageous to heat the solution, but *not over* 75 to 80 deg. Fahr., commencing the operation at the temperature of the dark-room, and slowly rising it, by means of a water bath, to the point where the details in the shadows make their appearance, and no more.

From these influences of heat it results that, in the cold season, heat compensates to a certain extent for the less actinic power of light, and that contrasts and intensity, details and softness, may be modified by the variation of the temperature of the developing solution.

We were able at the beginning of this winter to make instantaneous pictures by taking advantage of this method of operating, and to obtain details in copying colored objects with orthochromatic plates, sensitive to red, which we could not otherwise get, except by considerably lengthening the exposure.

* * *

WINTER SCENE ON THE THAMES. BY C. COURTCOLE.

A PHOTOGRAPH CONSIDERED EVOLUTIONARILY.

CAPT. W. DE W. ABNEY, the well-known photographic scientist, has little sympathy for those who are endeavoring to show the possibilities of photography as an art, by diffusing the focus of the image, or by the separation of planes by various artificial methods. At a recent meeting of the London Camera Club he read a paper upon "A Photograph Considered Evolutionarily," and of which the following are extracts.* He said:

"If we accepted Darwin's theory of evolution generally, we should have no difficulty in admitting that the eye, in common with the other organs of the body, had been evolved from simpler forms. What we might expect, if we had the power to look back and view the several stages through which the eye had passed until it reached its present state of efficiency, would be, in the first place, a simple organ which could merely discriminate between the presence or absence of light; next, an improved organ provided with a lens which would distinguish form. A future stage would be the provision of an iris or diaphragm, by which the image formed by the lens could be rendererd more distinct. Then would come the gradual perception of color, first one color, then another, and then the third—that is, if we accept the three-color sensation theory of Young and Helmholtz. Here we stop, having reached our present stage. Whether future improvements may be looked for it is impossible to say. It is certain that our prehistoric ancestors could not have foreseen the development which the eye was destined to assume, and in like manner we cannot guess at what the future may have in store for us. To put the evolution which the eye has undergone, briefly we might express it thus: (1) The appreciation of light; (2) black and white; (3) form; (4) color. Which gives the greatest amount of pleasure we can hardly say. For his part the contemplation of the spectrum gave him the greatest delight; he was never tired of looking at its beauties.

"Some might say that he had drawn a very fanciful picture of the evolution of the eye, but he certainly thought it far less fanciful than many other theories which were brought forward. We might draw some inferences by examination of the eyes of certain of the Mollusca. The *arca*, for instance, is one of these creatures which, although it has no head, possesses an organ which enables it to distinguish between light and darkness. The limpet has an eye which is rather more advanced in development, and the next stage is a depression which acts as a retina. Next we may refer to the eye of the snail, which has an orifice covered with a transparent membrane. Then to the eyes of the higher cephalopods, which can distinguish black and white, form, but not color. And, lastly, the human eye, with its appreciation of light, *chiaro-oscuro*, and color."

The lecturer showed upon the screen three diagrammatic sections of the eyes of Mollusca, which we now reproduce in rough form. "A is the section of the eye of the nautilus, and its likeness to a pinhole arrangement for taking photographs will be at once apparent. B, the eye of a gasteropod, shows distinct improvement, for the opening is covered with a membrane, and there is a lens. C, section of the eye of a more advanced cephalopod, exhibits an improved lens, furnished with iris, by which the images can be rendered more distinct. Such eyes are found in the animal creation around us, and it will be useful if we compare the crude form with a section of the human organ of sight.

"It will be observed that it is not necessary to have a head to have an eye, although we meet sometimes those who have heads, but no eyes. As an example he might point to the scallop, around the margin of whose shell dots might be seen, each of which was in reality an eye. And a highly organized eye, too, for it had a lens and retina. The lowest form of vertebrate eye is that of a wormlike creature with no lens to give distinct images. But the embryo of the same creature possesses one. It would therefore seem to retrograde as it grows older, and can then only see fuzzy pictures, a phenomenon which seems to be shared by some other creatures of a far higher type. The story he had unfolded of the evolution of the eye would not now perhaps be considered too fanciful."

Captain Abney then showed a series of experiments with colored light in order to demonstrate that the human eye exhibited traces of development. Some of these showed that when colored light was greatly reduced in intensity, all color vanished, leaving only the perception of light. Other experiments were devised to demonstrate that the centre of the retina is more highly developed than its edges, illustrating the axiom which asserts that those organs, or parts of organs which are most used, are most efficient in their action. It was shown that colors which were brilliant when directly looked at became white when observed with averted vision. Another experiment showed that the centre of the retina was also better for form as well as for color.

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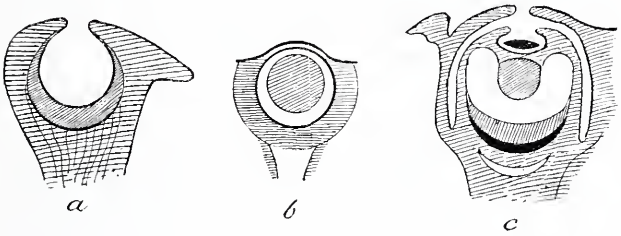
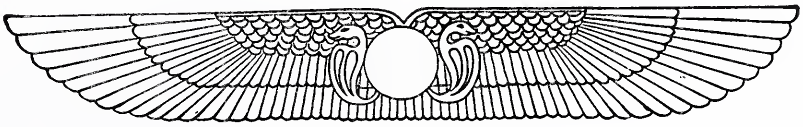
* From report published in *The Photographic News.*



"There was little doubt that the first color-receiving apparatus which was evolved was that which enabled the eye to appreciate blue, and a previous experiment had shown that blue was the color of which the eye was still most appreciative, even almost to the edge of the retina. Next came green, and finally red. A man who was color-blind through excessive use of tobacco would see the spectrum with the red as black, the yellow as white, but the blue as blue." "Here again the blue sensation is the most persistent and the oldest, and the red the least persistent and the newest.

"Applying this theory of evolution to our appreciation of pictures, the first stage is the pleasure we experience in looking at a black and white scroll. Next we have the combination of the first and second stage in the work of the engraver, and finally we experience the greatest pleasure in looking at a picture in which color is added to form and *chiaro-oscuro.*

"A photograph represents an attempt to render colors in black and white, or in monochrome, and unless its gradation of tones are true it is unsatisfactory to the eye. Engravers have been able to conquer this difficulty with great success, as can be proved not only by measuring the luminosity of the 'tints' which they produce, but also by putting side by side a photograph of a painting and of an engraving of that painting." He now showed two examples, and without going quite close to the screen it was next to impossible to say which was the photograph of the engraving and which of the original painting. "Photographers in general are encouraging the development of the sense of form, leaving that of color alone. There is always a tendency among human beings to lapse into barbarism, and some of us seem to be now lapsing back in our pictures to a former stage, when the lens and iris were not used. For his part he thought we ought ever to be going forward, and to take care that we did not lapse back to that remote period when the human eye was not better than that of the nautilus."



SPIRIT PHOTOGRAPHY.

BY MEREDITH B. LITTLE.

IN complying with your request to furnish you with certain, so-called, spirit photographs, together with a detailed statement of the circumstances under which they were produced, I must confess to a feeling of reluctance, from the fact that, judging from a strictly scientific standpoint, I have no evidence of value to offer, having had no experience of my own as a photographer. I could not take an ordinary photograph to-day without instruction. My confidence in the truth of the phenomena rests solely on satisfactory results, and the attending circumstances of their production.

Eleven years ago last fall I was associated with one of my neighbors, Dr. Huntington, a dentist and a sort of all-round mechanical genius, in investigating so-called spirit phenomena in the city of New York and vicinity. A friend informed us that there was a medium residing in the eastern part of Brooklyn, who was quite successful in taking spirit photographs. The Doctor proposed that we immediately hunt up this wonderful "Artist in Ghosts," remarking that he (the Doctor) had been at one time a professional photographer, and if the person mentioned possessed any such occult powers, he was exceedingly anxious to witness their manifestations, although he believed the whole thing to be a "fake."

We found our photographer located outside of the business part of the city in a small dwelling, a part of which he used as a seance room and for taking photographs. In reply to our inquiries, he informed us that he had used up all of his dry plates and was unable to procure more, short of William street in New York, and as the afternoon was then well advanced, it was too late in the day to procure and use them, hence he could do nothing for us.

The Doctor was, however, equal to the emergency, for, having obtained the size of the plates required, he immediately went to a photographer's studio, several blocks distant, where he succeeded in obtaining a half-dozen plates cut down to the proper dimensions and carefully marked for future identification. On his return, with the consent of the medium photographer, I was placed in the operating room, while the Doctor followed the medium into his dark-room, saw the plates taken from the package and each one of them in their turn placed in the slides and subsequently put into the camera.

In our first encounter with the ghostly world, I sat for the picture, but, saving my own profile, there was no manifestation shown on the plate. The second trial was made by the Doctor, and the plate showed the face of a young girl beside his own. I remarked there must be some mistake, as he had no children. With tears in his eyes, the Doctor replied, "you are mistaken. I lost a little girl six years old, before I made my home in Glens Falls, and this is her picture."

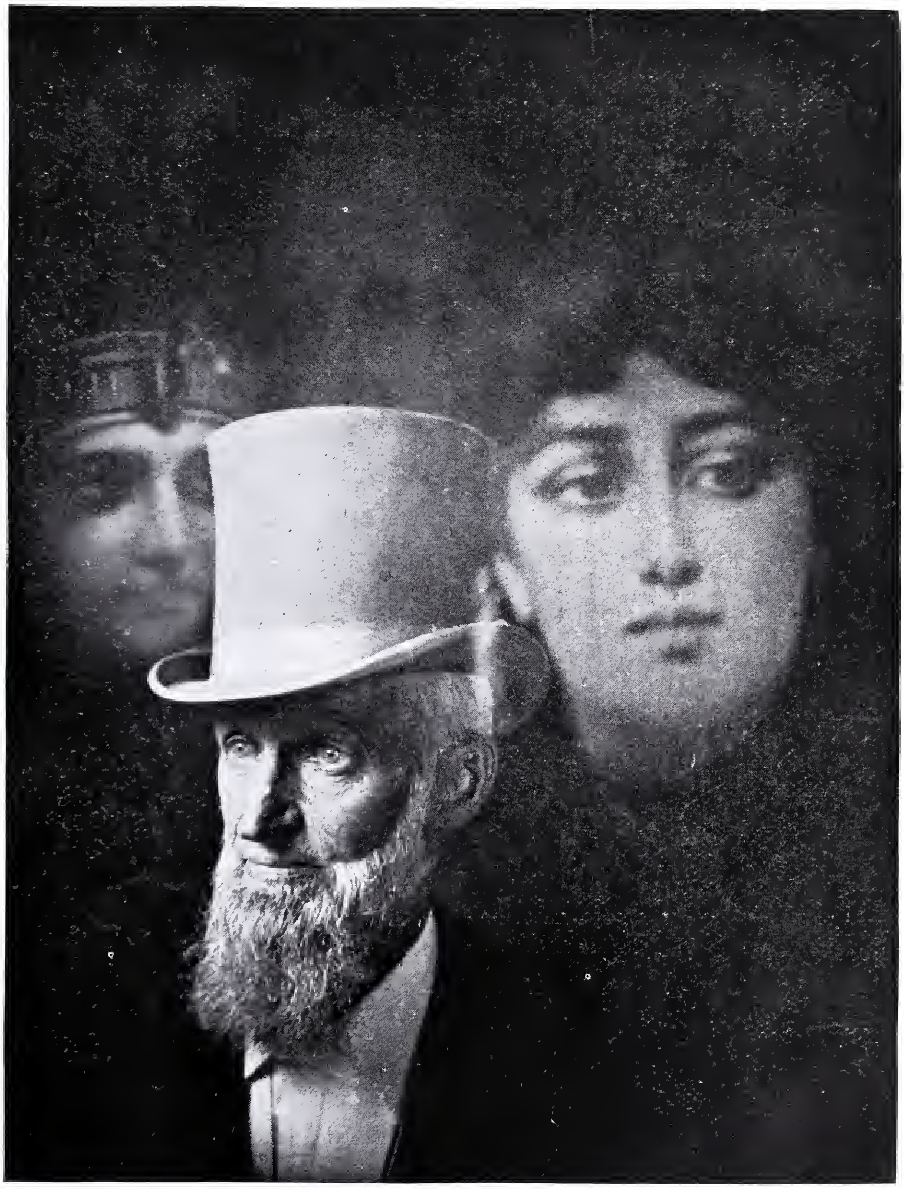
The Doctor sat again, and there appeared on the plate, as though standing behind him, the profile of a very intelligent person wearing a white bag wig and clothes of the fashion of more than a hundred years ago. We were subsequently informed that this form represented a German professor in a university at Leipsic, who had been in spirit life more than a century; however, as a further consideration of this picture will lead us into a field of phenomena foreign to the one before us, we will drop the professor here. A second attempt on my part, with unsatisfactory results, terminated our experiments with this medium.

My friend, Dr. Huntington, was well equipped as an investigator; the conditions and incidents of his early life had made him unusually keen and watchful in detecting any attempt at fraud. He was not like myself, a spiritualist, but, on the contrary, had often expressed himself as antagonistic to the claims of all, so-called, spiritual phenomena. However, in relating our experience with the medium previously mentioned, he expressed himself as fully satisfied that no fraud had been attempted or carried on; he further stated that the ghost producing photographer had admitted to him his own inability to explain the operation of the chemicals or process used by him in producing such wonderful results, and that, to him, his work was simply mechanical, he obeying the, to him, clearly discernible voices of the unseen.

Although I have had several experiences with this class of phenomena, since the occurrence of the incidents mentioned, nothing satisfactory came of it until I met Mr. Foster, of Indiana, at Onset Bay, Mass., in July, 1893. On the morning following the evening of my arrival at that place, I accidentally met that gentleman, a typical Indiana hoosier, almost the last person in the world I should have taken for a "Spirit Artist." As we met as total strangers to each other, I accepted his offer to give me an immediate sitting for a picture before he had an opportunity of learning my name or identifying me in any form.

Following the ghostly operator into his cottage, I found myself seated in a very small room with a side window. It contained little else than the operator's camera and two chairs. After the usual exposure had been made in the light, leaving the sensitive plate undisturbed in the camera, Mr. Foster curtained the window, so that the room became perfectly dark; then placing his left hand on the camera, with his right he removed the cap and made a second exposure of the plate for nearly five minutes in total darkness. Fortunately my new artist friend forgot to take my name for his register, and so far as having gained any knowledge of each other, we parted as much strangers as when we met.

When I called for my picture the following day, great was my surprise and delight to find a very correct likeness of my then recently deceased father, together with a beautiful face of a pre-historic spirit on the print as shown on photograph marked "A". There could be no mistake in the picture of my father being a correct representation of him, for every person to whom it was subsequently shown, personally acquainted with him in earth life, recognized it at sight, besides in position and expression it was unlike any photograph that had ever been taken of him. These experiences with Dr. Huntington and Mr. Foster have been the key to my confidence in other and later manifestations along the same line of phenomena



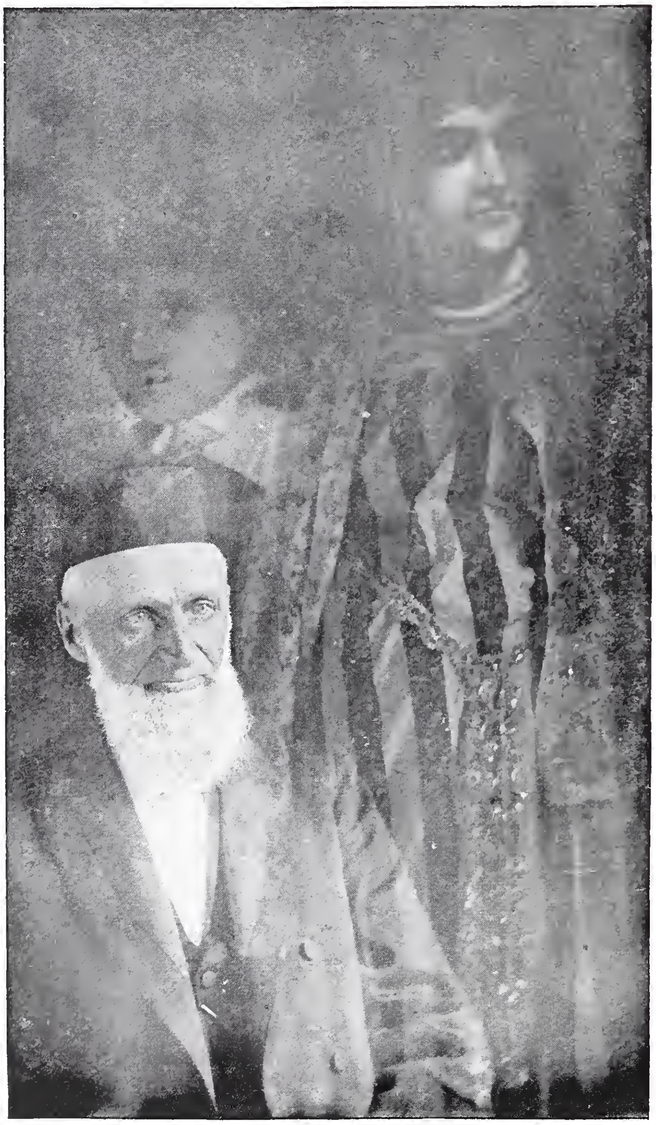
B.—PHOTOGRAPH SHOWING "SPIRIT" FORMS.

During my stay of a month or more at Onset, I made it a practice to interview, so far as possible, Mr. Foster's many patrons as to the results obtained by them. I learned that about one person in three had been well satisfied, assuring me that they had obtained pictures of their deceased friends or relatives. Among the faces on these photographs I recognized several former acquaintances I had met in previous years at Onset, but now deceased.

Before leaving Onset, Mr Foster invited me to sit for a picture on a large plate; the result you will find on photograph marked "B". The two female faces represent pre-historic spirits, the third being that of my father. This picture is considered an unusually good specimen of phenomenal work.

Last summer at Onset I had a number of good seances for occult pictures with Mr R. L. Green, and while disappointed in not obtaining photographs of certain persons once mortal friends, yet some of the manifestations in other lines were exceedingly fine and satisfactory. The process by which this medium obtained his phenomenal pictures was similar to that employed by Mr. Foster the previous summer, the first impression on the sensitized plate being made in the light, followed by a much longer exposure in the dark.

Mr. Green was at that time only a novice in the photographic art; his experiments were limited to only a few months; his work was purely mechanical, and confined to the simplest process.



C.—PHOTOGRAPH SHOWING "SPIRIT OF PRINCESS WYNONA."

The photograph marked "C" is the result of our first experiment. It contains a picture of my Atlantean spirit friend, Wynona, together with several other faces to me unknown. You will doubtless observe that there is a variation in the countenance of Wynona from the ones on the Foster pictures; the face in this picture is longer and the expression more intelligent, while the manifestations of a dignified and gentle nature are retained.

The form shown on the long photograph marked "D" is, I think, the first full length phenomenal picture ever taken. I forward it with the others for the reason that it shows a serious defect, in that the arm of the figure is out of all proportion to the face and the body; this defect is explained, from the unseen side of life, as a miscalculation on the part of the spirit artist who prepares the semi-material, but unseen mask, which is really photographed, as will be explained further on.

Photograph marked "E" represents a prehistoric spirit, an Atlantean sage, but the form is quite dark, and almost indistinct.

The representation of Wynona, Princess of Atlantis, on photograph marked "E" is indorsed by that spirit entity as faithfully representing her features as they appeared at the time of her physical death, at the age of 22 years.

In the preparation of this paper I have endeavored to avoid, so far as possible, any reference to spiritualism or other phases of its varied phenomena, of which I presume many of your readers cherish a "holy horror," yet there are some explanations required to properly round out this statement that can only be drawn from that field.

Through an entranced test medium, a stranger to Mr. Green, the photographer, I was in daily communication with Spirit Wynona, while these pictures were being produced, and the photographer as well as myself simply followed her instructions, acting on her suggestions. I kept a slide containing one of the long sensitized plates as near my person as possible for twenty-four hours before it was placed in the camera for the picture; this was done to thoroughly magnetize the plate; it was also arranged between the spirit and myself whose portrait should, or rather would be expected to, appear

Union Photo Engraving Co

CHRYSANTHEMUMS.
PHOTO BY R. DULK.

in the picture at each sitting, and although this information was carefully withheld from Mr. Green, yet the form of the spirit previously agreed upon between us always appeared on the plate.

Permit me to close this long article by giving Spirit Wynona's own version of the process by which these occult pictures are produced, as she understands it from the spirit side of life.

In properly considering this subject, we should first understand that the condition of spirit is not perceptible to any of our five physical senses. Persons say : "I saw a spirit"; this is a mistake, no person while in a physical body ever saw a spirit It is simply impossible for such phenomena to occur. There are, however, many persons with clairvoyant powers, more or less developed, who plainly see and describe *manifestations of spirit ;* that is, the spirit is able to show a clairvoyant picture of itself to the psychic, not appearing as it is in spirit, but as it once was, or would have been, when matured in earth life. In all such cases there is, of necessity, an approach of the material toward the condition of spirit, and of spirit toward a condition of materiality, without which no phenomena can be produced.

The success of a spirit in its attempt to manifest its presence on the sensitized plate of the photographer depends greatly on its ability to impress on the unseen spirit artist a correct conception or idea of its own mental picture of itself. When this mental representation becomes sufficiently tangible to the unseen spirit artist, he prepares a very thin mask in which he reproduces this idea; the mask is of semi-material atoms and is covered with a semi-luminous substance emitting sufficient light to affect the plate in a long exposure, but not sufficiently material to be perceptible to human sight.

This then, is the process by which the impression of the face of a spirit friend is made on the sensitized plate, from which the sun printed picture is produced by the usual process, and for the accuracy of resemblance much depends on the artistic ability of the unseen spirit artist. This description, however, is only relatively correct, for we have no words in our language to properly express anything pertaining to spirit, its condition, laws or expression, hence we are obliged to use such terms as "mask, semi-material and semi-luminous," when they do not exactly express the ideas intended to be conveyed. This then, is a description given by a spirit entity of one of the processes by which a so-called spirit photograph is produced.

The theory of light, imperceptible to mortal vision making an impression on a photographer's plate, in a long exposure, is not a new one, for a vast number of stars have been discovered by this process that cannot be seen through the most powerful telescope yet constructed. Several years ago, in New Zealand, some photographs were taken of certain stars in the Milky Way, which were shown by this process to be much larger in proportion to the surrounding ones than they appeared through the aid of the telescope. Investigation demonstrated the fact that these stars emitted an unusual number of blue rays of light, which were unperceivable to mortal vision. Hence we are obliged to admit that there are rays of light in the ponderable world about us that affect a sensitized plate that are quite beyond the perceptibilities of our mortal perceptions. See Editorial Notes.—Ed.

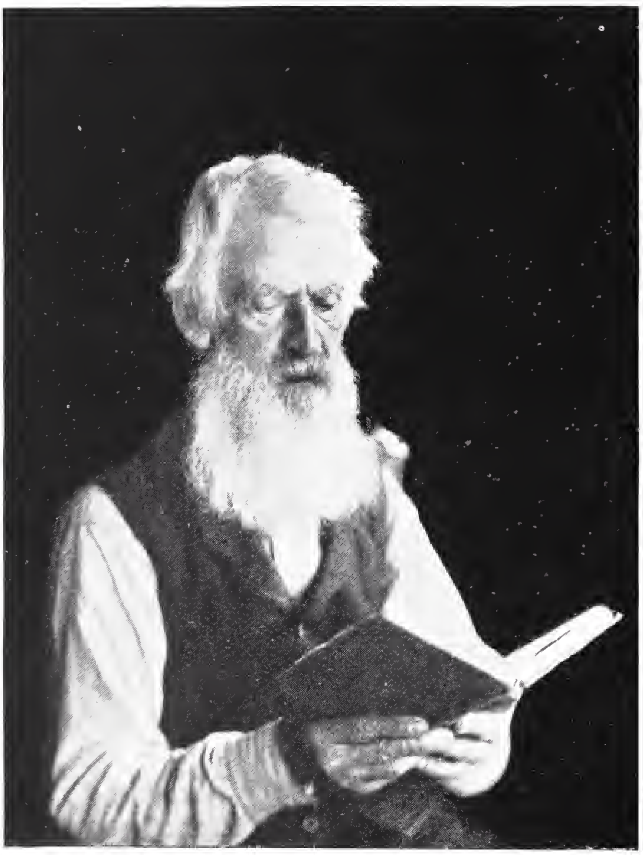
THE OPPORTUNITIES WHICH AN OLD TOWN OFFERS FOR PHOTOGRAPHIC STUDIES.

BY EMMA J. FITZ.

[Illustrated from photographs by the author.]

ONE locality so seldom offers the amateur a wide range of subjects, that when a place is found abounding in opportunities for photographic studies, it seems worthy, not only of mention, but of a somewhat detailed description.

It is to a certain old town on the North Shore of Massachusetts that this sketch refers. Standing on a rocky pedestal overlooking the neighboring harbors and the more distant ocean, it commands not only a wonderful marine view, but it is also favored with a picturesque landscape, stretching off to the north, south, and west. Ancient willows outline the lanes and winding roads, boulders and ledges accentuate the hillsides, while the green valleys form the pasture-land of many cattle.


By Emma J. Fitz.

A VETERAN OF THE VILLAGE.

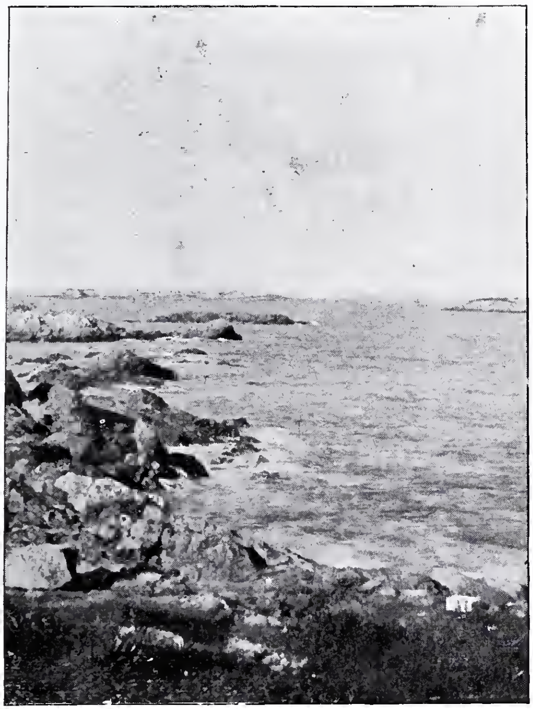
Not less interesting than its environment, is the town itself, for there is little in New England which can antedate the settlement of Marblehead, and it is rich in memorials of the past.

Time has dealt kindly with its landmarks, and weather-beaten houses, old, even a century ago, still stand and bid defiance to the storms which only too often sweep in from the sea. The fine old timbers may creak and strain, but with a resistance worthy of the Puritan vigor which put them into place, they meet the force of the tempest, and stand firm upon their rocky foundations.

Here, too, are the homesteads of the Revolutionary period, and the mansions of the prosperous merchants of that date.

All these dwellings offer to the photographer colonial doorways, curious porches half buried in a wealth of vines, or small paned windows against which the many colored hollyhocks lean. Nor must the gardens be forgotten, for they are the pride of the busy housewife, who may be seen in the early morning ruthlessly pulling up the intruding weeds. The rustic fence can scarcely keep within bounds the flowers—old country favorites—which grow in a bewildering confusion of color, and which form a pleasing environment for the sturdy figure crowned by the large sun bonnet. However intent upon her work, this toiler amid roots and blossoms has always time for a chat over the garden gate with a passing neighbor. In visiting this, as other towns, progress has left its trace behind in electric cars and lights, but it has not quite banished the village element which clings—a somewhat tattered garment it is true—about the old town. It is this glimpse of village life that delights the artist or photographer. No one could fail to be impressed with the changing scenes about the battered town pumps and the wells—for they are both social factors. Here little groups of children quench their thirst, or men and women fill the wooden pails and buckets with water for household uses. Many a bit of news is exchanged over the brimming pails, and tired faces grow brighter for the neighborly greetings and the moment's respite at the well.

But there are other opportunities for the camera than those to be found in the irregular streets which wind in and out among the old houses; even the stately trees cannot entirely absorb the attention of the wanderer in search of photographic subjects, for there before him lies the harbor. That most picturesque little harbor, with its dories and sailboats, its tiny steamers plying back and forth, its beautiful yachts, its wharves, toward which some heavily-laden schooner is always drifting. Brilliant as is the scene on a bright summer morning, with a hundred sails or more filling with the wind, lovelier yet when on a calm day the glassy water reflects in a wonderful way every object upon its surface—it reaches its highest beauty only in the glow of the sunset. It has then a beauty which words are too colorless to depict. Even the most audacious camera can scarcely hope to get more than a hint of its charm.



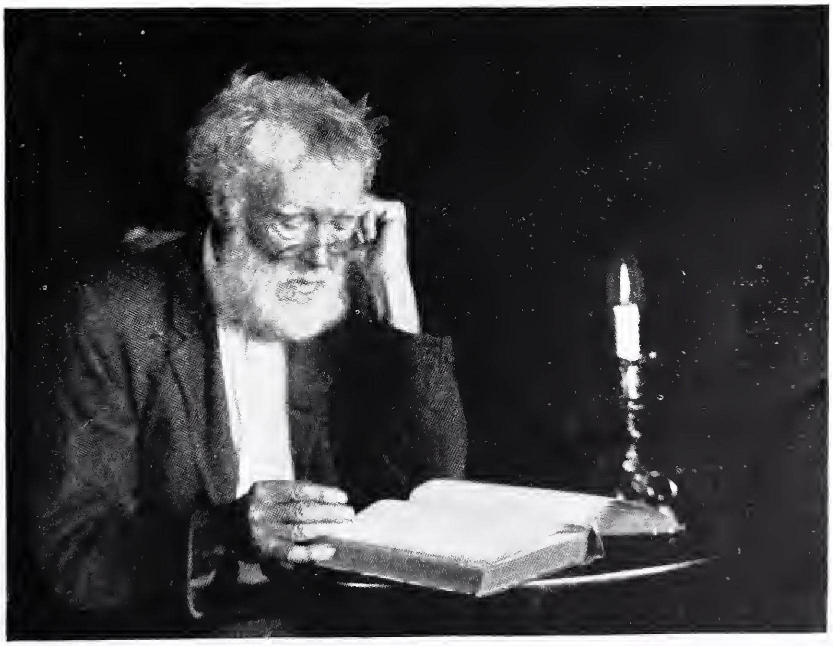
By Emma J. Fitz.

MARBLEHEAD ROCKS.

Not to be omitted in the search for the interesting and the picturesque, are the little beaches where boats are built and launched, where fishermen mend their nets, and lobstermen repair their crates. Here, too, are the wagons, waiting to receive their morning fish from the heavily-laden dories. It is on these beaches that the lobsters, fresh from the traps, are packed in barrels of ice, protesting viogorously, by their wrigglings, against their cruel fate of being half-frozen one hour, only to be boiled alive the next.

Here, too, old and decrepit sailors, wrecked not only on the Grand Banks, but also on the ocean of life, sit by the hour warming themselves in the summer sunshine, resting against some broken spar, and telling long stories of the perils of the sea. Few towns are so rich in veterans, as is this seaport, and he who is in search of figure studies, will scarcely find, anywhere, models more worthy of his art. The out-of-door life which they have led has brought with it a vitality which does not desert them even at fourscore years. They may be found in groups haunting the fish markets and the strips of beaches, or seated on casks and barrels outside of grocery stores. Those who have more than the usual vigor, climb the ledges—sit either in the little parks which surmount every height, or they settle down for the morning, or afternoon, in the old graveyard where lie the ashes of their forefathers. This hilltop burying-ground is one of the most interesting features of the town, but most beloved by the old men.

They never dream of the picturesqueness which they add to the scene; but their bronzed faces surrounded by gray beards, or heads surmounted by snowy locks, the deep lines of



By Emma J. Fitz.

READING THE EVENING HYMN.

character left upon their faces by the hard struggle for existence—all these features appeal to the observer. These old men in their rough garments, pass long days among these graves marked by headstones of gray slate. The grief of the seventeenth century seemed to take a grim satisfaction in expressing itself through stone carvings of weeping willows, skeletons, serpents aud gloomy cherubs, and this particular churchyard abounds in examples of art at this crude stage. But the gloomy epitaphs and ghastly representations of death, perhaps through years of familiarity, fail to exert a depressing influence upon the veterans. They are a cheerful race and discuss, not the world which they are so soon to enter, but the prospect which lies before their mortal eyes on the distant ocean. If one of them is fortunate enough to possess a spyglass, he scans the far horizon, and notes the sails which seem to fly over the blue waters.

But one sees the veteran best by his own fireside. Seated in his favorite chair he loves to narrate the superstitions and traditions of the people; proudly he shows the time-worn table on which he rests his book as he reads the evening hymn by the light of a solitary candle. With equal pleasure he displays the chairs which have descended to him from his ancestors, or with his kindly smile he will offer the visitor a cup of tea served in china that is itself a relic of the past.

But it is useless to try to enumerate all the photographic possibilities of an old town, for if it were possible to exhaust the figure studies, new combinations of sea and sky, or land and water are constantly arising from the time when the earth is wrapped in morning mists, until day surrenders itself to twilight, and earth, sky and water are bathed in the afterglow of the sunset.

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By C. M. Trowbridge.

MEDITATION.

MORENO'S DEVELOPER.

BY BERTHOLD BLAUERT.

By Morrison, Chicago.

THE question as to the best developer for gelatine dry plates has been discussed time and again and is still an open one. Oxalate of iron is undoubtedly a very good developer, and for bromide paper it is unsurpassed, but it requires particular care in manipulation and more for this than for any other reason it has been pushed aside by pyrogallic acid. Then came hydrochinon, paramidophenol, eikonogen, rodinal, metol, glycin, and a score of combinations of them. But, nevertheless, pyro holds its own to-day, and many photographers after having been led astray by the new group of developers return to pyro. How many pyro developer formulæ exist, I do not know, but I have tried a great number of them. The last that I tried was the one published some time ago by Mr. A. Moreno, the well-known photographer of New York, and in my opinion it is the very best developer, and I think that in future I shall never work with another formula.

Here it is:

I. Saturated solution of carbonate of soda.
II. Saturated solution of sulphite of soda.
III. Take of solution II. any quantity, say 4 ounces in a glass, and add to it dry pyrogallic acid (Merck's preferred) as long as it will easily dissolve by shaking, and keep this in a well-corked bottle.

For developing, take of solution I., 3 ounces; of solution II., 6 ounces; of solution III., 2 drachms.

This will make a good developer for Seed or Eagle plates; other plates require more pyro (solution III.) up to 4 drachms for American plates. More sulphite (solution II.) gives a more bluish-gray tone to the negative.

This quantity will be sufficient to develop about one dozen 5x7 plates.

Then it would be advisable to make up a fresh amount as stated before, and add of the old developer enough to make 16 ounces, as in this proportion it will work better for correctly exposed plates.

The developer, after the day's work is over, should be kept in a well-corked bottle for future use; it will keep for a long time. Its color will be a light orange. For fully exposed plates the old developer is better, and for short exposed plates fresh mixed developer is of course preferable. Plates which are very considerably over- or under-exposed, are better thrown into the waste barrel.

Slightly under-exposed plates I take out of the developer and flow over with some of solution I. (carbonate of soda), and repeat this operation, if necessary, and it is astonishing how quickly the details appear. Then I return the plate to the developer and finish. It has been stated that this latter operation produces fog on a plate, but this is absolutely untrue. I have worked nearly all the prominent brands of plates in this way, and never had a fogged negative.

The success of this developer depends upon whether the stock solutions I. and II. are *well saturated. There must always be undissolved crystals of carbonate of soda and sulphite of soda in their respective bottles.*

Negatives thus developed are very soft, rich, full of details, and of excellent printing quality.

As this developer is very heavy in its solution it flows over the plate like oil, air bubbles are never formed, and it does not stain the fingers any more than eikonogen.

Any photographer who will give this developer a fair trial will surely like it, for it is simplicity itself. There is no weighing or measuring in making up stock solutions. In fact, Mr. Moreno never measures the proportions in making up developer.

The resulting negatives are far superior in printing quality to those developed with any other formula.

COLLODIO-CHLORIDE FOR TRANSPARENCIES.

IN a paper read before one of the principal photographic societies of England,* Mr. J. S. Teape gives his method of producing collodio-chloride plates for transparencies and lantern slides.

After detailing the unsuccessful results he obtained by following the processes that have been from time to time recommended by various authorities he describes his own method. "The following," he says, "has proved to be a complete success in my hands:"

Pyroxyline	32	grains
Ether (725)	3¼	ounces
Alcohol (805)	2½	ounces
Chloride of zinc	40	grains
Nitrate of silver	92	grains

"Dissolve the chloride of zinc in the alcohol (and this is a valuable quality of chloride of zinc, that it will dissolve in the alcohol without the addition of water), put in the pyroxyline when soaked, add the ether, and shake. Now put the silver into a test tube; add forty minims of distilled water. At this stage I prefer to use a non-actinic light. A single thickness of amber glass will do. There is no necessity for working in a dull light. We now dissolve the silver by heat over a spirit-lamp flame, and at the same time heat six drachms of alcohol in a small flask; when the silver is dissolved, add about a drachm of hot alcohol to it by degrees. Then add to your collodion, a drop or two at the time, and shake well between; rinse out tube with the remaining alcohol. If the operations have been carried out properly, a few drops of the emulsion put upon a plate will show an orange tinge; a fairly thick film, a full orange inclined to ruby when held up to a light. The emulsion must be kept for not less than twenty-four hours. This emulsion may be washed in the ordinary way. I use it without washing as a rule, as washing entails the consumption of twice the quantity of solvents. To filter, place a plug of wool or good sponge in a glass funnel, and run the emulsion through. Moisten sponge or wool with a few drops of alcohol first.

"Coat the plates, and place them in a dish of water until the water runs smoothly over the surface, then rinse with two changes of water. Wipe the backs, and drain on blotting-paper; or, when plates are wanted quickly, a piece of blotting-paper may be placed on face of the plates, and gently pass a finger over to absorb all surface water. After this, they dry in five to ten minutes by the use of such a piece of apparatus as I show you. The usual drying cupboard will do of course.

With this emulsion no preservative is at all necessary. I have found no difference in the results. One thing I have forgotten to mention in the proper place, that is, the use of a substratum to prevent the film slipping off the plate during washing. I strongly recommend edging the plates with India-rubber solution. This is quickly done with a small camel-hair brush cut to about a quarter of an inch long in the hair. A dozen of lantern plates can be done in five minutes easily.

The results which I show you have been developed with Abney's

Ferrous citro-oxalate	1 part
Ten per cent. bromide potassium solution	1 part

"Glycin, I have only tried one formula given by the makers, that for hard development; and hydroquinone, as follows:

Hydroquinone	4 grains
Bromide potassium	24 grains
Sulphite of soda	48 grains
Water	1 ounce

"Three minims of a ten per cent solution of carbonate of soda.

"Development was from five to twelve minutes. All these developers may be used repeatedly. Hypo must be used for fixing; two ounces to the pint is strong enough. Washing in the hand for about a minute is enough to remove the fixing salt.

"The light used by me was magnesium, six to thirty-six inches. The colors are black, claret, and most beautiful purples to purple black.

"And these I must ask you especially to notice are produced by simple development with simple collodio-chloride emulsion."

The London and Provincial Photographic Association.

SOME EXPERIMENTS IN ELECTRIC PHOTOGRAPHY.

IN a recent issue of that interesting magazine, the *Physical Review*, Prof. Fernando Sanford gives the results of some of his experiments in so-called electric photography. He says:

During the past three years, I have been occasionally engaged in some experiments upon electric photography which may be of interest to the readers of the *Review*.

In 1891 I developed a negative image upon a piece of bromide paper which had been placed between, and in contact with, two pieces of metal which were connected with the poles of two chromic acid cells. These negatives showed only the places of contact of the sensitized side of the paper and the one piece of metal. During the same year, I developed characters written upon a sensitized plate with the end of a wire, the other end of which was connected to one terminal of an induction coil. In September, 1892, I read the article upon Breath Figures, by Mr. W. B. Crofts, in the *Philosophical Magazine* of August, 1892, and it occurred to me at once that these figures might be developed upon a photographic plate. I at once tried the experiment of laying the coin upon the sensitized side of the plate, and connecting it with the terminal of a small induction coil, capable of giving a spark of three or four millimeters, while a piece of tin foil upon the opposite side of the plate was connected with the other terminal of the coil.

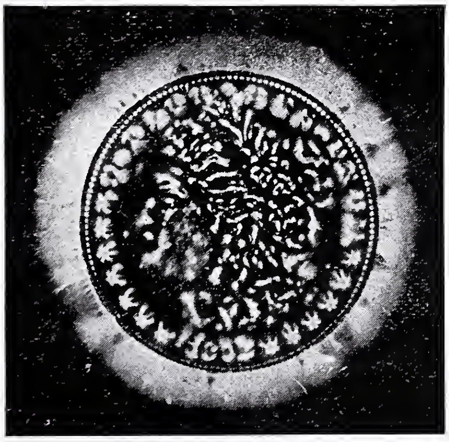


FIG. 1.

Several negatives were made in this way, the accompanying photograph, No. 1, being from one of them. With one exception, they all show a fringe around them, due to the escape of the charge from the edge of the coin, which accounts for the formation of the dark ring observed around the breath figures made upon glass.

Last September I undertook to photograph in the same way objects insulated from the photographic plate, and have since made negatives of coins separated from the plate by paraffine, shellac, mica, and gutta percha. The accompanying photograph, No. 2, was made on October 7, the coin being insulated from the photographic plate by a sheet of mica about 0.04 mm. thick. The mica was laid directly upon the film side of the plate, and the coin was placed upon it and connected to one terminal of the small induction coil already mentioned. A circular piece of tin foil of the circumference of the coin was placed upon the glass side of the plate directly opposite the coin, and was connected to the other terminal of the induction coil. The little condenser thus made was clamped between two boards, and was covered up in a dark room. Two small discharging knobs were also attached to the terminals of the induction coil, and were separated by a space of less than a millimeter, so that, when a single cell was connected with the primary coil, the spark between the knobs seemed continuous.

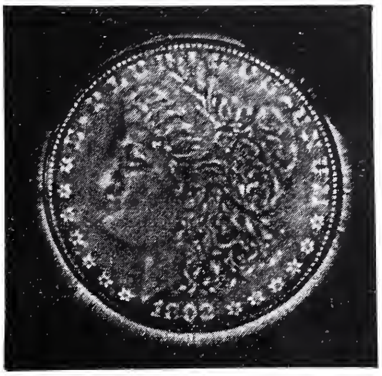


FIG. 2.

The plate was exposed to the action of the waves set up in this condenser for one hour, when it was taken out and the negative image developed upon it by the usual process.

Several interesting facts are shown by these photographs, and it has seemed to me that the process might furnish a valuable method of studying some of the phenomena of condensers. The fact that the electric waves sent off by the condenser plates are propagated in a direction perpendicular to the plane of emergence is plainly shown by some of the negatives in my possession. The tendency for the charge to escape from the surfaces of greatest curvature is plainly shown, as in photograph No. 1. The surface of a coin which had been stamped with fine parallel lines gave no image upon the plate, on account of the dispersion of the waves from its surface. In the case of a medal with a head of Washington in high relief, the whole head was left blank, but was outlined by a fringe like that around the edge of photograph No. 1.

I did not succeed in making a good negative through a thickness of insulator as great as one millimeter, but blackened spots of the size of the coin were made through several millimeters of gutta percha, even with the low potential mentioned above. Unquestionably, with a greater sparking distance, the effect could be observed throughout a condenser of much greater thickness.

THE MYSTERY OF DEVELOPING.

BY W. B. DIMON.

FOR a long time I was very curious to know the why and wherefore of the action of a developer. I applied in vain to numerous practical photographers. Their answers were substantially and figuratively: "When the boy turns the crank the grindstone will revolve." I had turned the crank until I was tired. Sometimes the stone went round and sometimes it would wabble. Everything and everybody, by their ignorance (certainly not by their profound wisdom) seemed to conspire to defeat my curiosity. I was not to be put off, but closed the laboratory door behind me, and pursued my search perseveringly to the end. As there are so few who know, or, longing, have not the time or convenience to pursue the subject, I trust the reader will permit me to repeat upon these pages the lesson learned.

Our plates have been covered with a gelatine emulsion to form a retaining surface in which molecules of bromide of silver are imbedded.

Upon exposure to light, the silver bromide thus held by the gelatine solution is converted into what is termed silver sub-bromide. The corrrectness of this appellation I do not propose to discuss, but will consent to so name it for the present purpose.

When silver bromide is exposed to light, undoubtedly some change has been affected among the molecules of silver bromide, but just what that change is, is still a matter of discussion, but this we do know, that it is willing to readily give up its bromine.

This having been given up and the developing solution poured on, a combination takes place between the bromide and *something else*, each original molecule has been left just where it was, but has now become metallic silver, and its intensity is more or less opaque according to the greater or lesser strength of the reflected ray of light which touched upon the original molecule.

Here then we have the reproduction of our object in metallic silver, but in the reverse order of the original.

This *something* that will unite with bromine is hydrogen. It is not pure hydrogen, but hydrogen in a nascent state, that is, when held lightly in combination with some other element, and just in the condition of parting from it.

In water we have an abundant supply of nascent hydrogen. But water is composed of hydrogen and oxygen. Whatever will decompose water and withdraw from it the oxygen, will liberate hydrogen.

There are a great many of these agents capable of decomposing the water, among them, some of the most effective agents have been found to be, some salts of iron, gallic acid, pyro, hydroquinon, eikonogen and others.

For developers, each has its strong advocates, and I have no desire to provoke any discussion as to the relative merits of any. Whatever agent is used it must be a deoxidizer, and in using this term I mean it to apply to any one that is chosen. A deoxidizer then is any agent that has a strong affinity for oxygen, and that will cause it to release the hydrogen it holds in combination. The action of a deoxidizer can be held in check according to the amount of acid held in the compound.

Our deoxidizer, in decomposing water (H_2O), combines with the oxygen, thus releasing the hydrogen. This hydrogen enters into combination with the bromine from the silver sub-bromide of the exposed plate and forms hydrobromic acid $H + Ag_2Br = HBr + Ag_2$. Acid retards decomposition of water and hence compels a cessation of action on the part of the deoxidizer, or, in other words, it annuls the effort of the deoxidizer. Its power is not gone but simply held in check. To save ourselves something must be done to get this new product or acid out of the way, and what more natural than to dissolve it. Acids combine with alkalies to make salts. By introducing a trace of some alkali such as sodium carbonate or potassium carbonate, the two will unite and mutually dissolve each other and form sodium bromide. Here we have the key that unlocks the combination. The alkali clears the acid débris formed by the dissolution of water and the union of hydrogen and bromine This being removed there is no longer any restraint upon the action of the deoxidizer and it resumes its work.

If then we would accelerate development, keep the rubbish product out of the way by the use of an alkali. If we would prevent too rapid development, allow the acid to accumulate or supply an acid.

The action of the sulphite of soda is to stimulate the deoxidizer into action. It is often the case that two elements will not unite perfectly until after a third is introduced, although the third enters not into combination nor loses any of its value.

To recapitulate, our main object in development is to obtain or retain a deposit of metallic silver. We must first expel the bromine by aid of hydrogen. We obtain the hydrogen by a dissolution of water caused by the introduction of a deoxidizer. The action thus secured produces an acid that counteracts the original action at a certain stage. To dispose of this acid an alkali is used. Thus the work goes on by action and counteraction, showing that a sufficient quantity of any of the ingredients must be definite, and that a surplus of what is needed is but a waste.

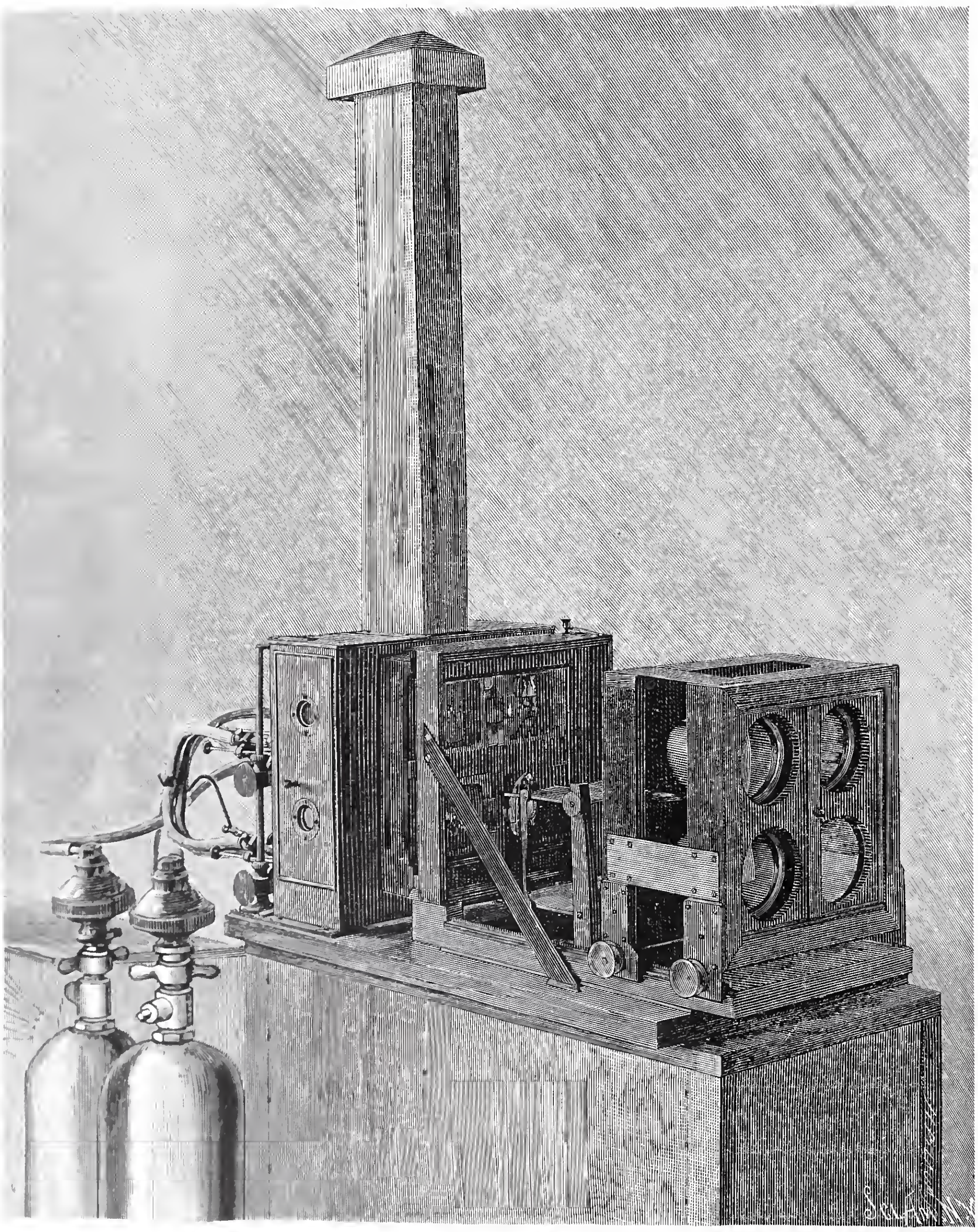
* * *

ALONG THE LAKE. BY E. L. BAER.

THREE-COLOR PROJECTION.

BY R. D. GRAY.

I HAVE made no important modifications of the methods used last season, but with improved apparatus I get the negatives of exactly the same size, which facilitates the final registration of the images upon the screen. The process of obtaining three negatives with ortho plates has often been described. The most successful workers, however, have not given spectroscopic analysis of their color screens, or divisions of the colors effected by them. There are still different opinions concerning this as well as the number of colors required to reproduce all the rest. In my experience of lantern projections the combinations resulting from purple, yellow, green and blue lights have been most satisfactory, but red, green and blue can be modified so as to show all colors likely to be desired in one picture. Red and green lights combined should, according to theory, produce brilliant yellow, but in fact they show straw board color, or yellow ochre at best. Orange and yellow-green lights make a better showing for yellow, but the orange with blue fails to give a satisfactory purple, so when we project with three colors we must first decide whether yellow or purple is to be sacrificed, and select the color screens accordingly.



GRAY'S APPARATUS FOR THREE-COLOR PROJECTION.

Plain lantern-slides projected with colored lights show most delicate gradations of color and shadow, but mixtures of three pigments as in the printing processes give secondary colors of more purity. Our printers have not been accustomed to such delicacies of manipulation which are required to complete uniform pictures by three impressions with pure colors, but these details are receiving much attention, and we have good reasons to expect great things from that quarter very soon.

"WHERE SEA MEETS LAND IN DAILY STRIFE."
BY ARTHUR J. GOLDING.

To those who wish to experiment with color projection I suggest a method of registration by which two people can, after a little experience, complete twenty pictures in an evening. A lantern with three or more optical systems is necessary, it should be provided with means of getting the objectives in place again if they should become deranged in cleaning or otherwise, and have spaces for inserting stained glasses between slide and condenser. Oil lamps will do for registering purposes, but the light is too yellow for color experiments. In a wooden frame, with spaces that correspond with each optical system, place one of the slides and secure it with gummed paper. Next attach the second slide to the frame by means of a mechanical device which resembles a hat rack, or a compound slide rest of a turning lathe; it has three fine screw adjustments by which the picture can be moved horizontally and either end be moved up or down. The first slide is now focused on the screen, and a man at the lantern moves the second slide as directed by an observer near the screen until the two images coincide exactly—glasses tinted slightly with opposite colors and placed behind the slides will help distinguish one image from the other. A little hot sealing wax dropped at the edges of the second slide will hold it there until the machinery has been removed and gummed paper applied. The operation is repeated until all are finished, then glasses are placed behind each slide; they should be of similar color to the screen used for taking the negatives. Lime or electric light is necessary to show all of the colors.

If three positives are used, and they are equally transparent in one part of the picture, the red, green and blue lights passing through that part will appear white on the screen. If the blue positive is more opaque in that portion of the picture, the red and the green lights will predominate, producing yellow; or if the green positive should be opaque, the red and blue lights in excess make purple. Thus the varying degrees of opacity in the positives caused by the selective qualities of the photographic plates and color screens, however slight, are effective, and the resulting picture shows the delicate tints as well as the brilliant colors of nature.

* * *

From "Photographic Review."

By W. E. & W. B. Loomis.

COMBINATION CHILD PORTRAIT.

THREE COLOR PRINTING.

BY DR. A. MÜLLER-JACOBS.

IT is certainly not very encouraging, but it is nevertheless a fact, that the making of perfect three color print negatives, without artificial aid, is nothing more than a matter of accident. Let us approach nearer to the method, and the reasons for my assertion will be easily understood.

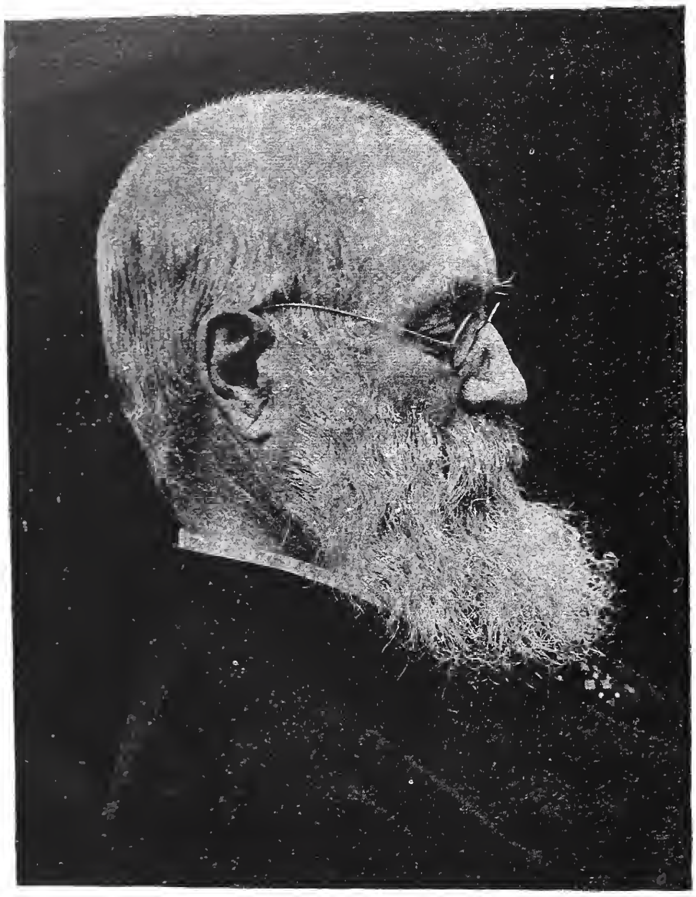


FIG. 1.—REPRODUCTION FROM A PHOTOGRAPH.

Three pigments, yellow, red and blue, when intimately mixed in certain qualitative and quantitative proportions will produce a neutral black—that is, a black without reddish, bluish, or any other color shade. Such ideal black, diluted and mixed with a white color stuff, white lead for example, in certain quantity, will naturally give a neutral gray, without any color tone prevailing. The same will result when the elementary colors, yellow, red and blue are printed on paper, one upon the other. If the surface the three colors are to be printed upon is undivided, black is produced, but if the paper is divided by lines or stipple, an optical delusion takes place, and by means of portions of the pictures not having come in contact with the pigments, on the white of the sheet, the black is changed into gray, provided, however, the printing surfaces of all the three plates are perfectly equivalent to each other. *The printing surface of the three plates disturbed in the least in their equilibrium, that is, if the printing surface of one or two plates exceeds that of the third, the print is neither black nor gray, but shows distinct color tones, in which any of the spectral colors, red, orange, yellow, green, blue, or violet may predominate.*

In this manner, all possible color tones may be produced. The principle of three color printing depends much upon this fact, and if every part of the process be carried out properly we would be enabled to reproduce natural colors with perfect truth and exactness.

To do this, a variety of difficulties must first be removed. Let us suppose a certain object is to be reproduced by three color printing—an oil painting, perhaps, containing a variety of colors, one of them a neutral gray, like that of a landscape enshrouded in a heavy fog. Have the three negatives

FIG. 5.—REPRODUCTION FROM A STEEL ENGRAVING.

been properly exposed by accident; have ray filter and sensitizer performed their functions correctly; has the collotype plate (we will first consider this method of printing) printed without faults; has over or under exposure been avoided, then we may justly expect a color reproduction, as near as possible to the original. The sky will appear in correct neutral gray, and all colors and color shades will appear in natural gradation; but were one of the three negatives or one of the printing plates over or under exposed, injudiciously intensified, and of such a character that the printing surface of the two others predominate over the first, the foggy sky of our picture would not be reproduced in neutral gray, it would be of a reddish cast and the landscape be flooded with a light resembling that of sunset, or it would be of greenish or bluish cast, quite different from the colors of the original. Let us take notice that tone deviations are less perceptible in the intenser than in the lighter portions of the picture.

Far more perceptible would these disproportions manifest themselves if instead of collotype printing, the Meissenbach plate, in high relief on zinc or copper, and printable upon the ordinary type press should be selected. This process requires three diapositives taken directly from the three original negatives, and from them corresponding line plates, finally to be printed upon zinc, copper, or the lithographic stone for subsequent operations.

It would be a very notable and extraordinary occurrence if the intensity proportions of the three original negatives were preserved through all these operations down to the last transfer and etching. But the slightest error would disrupt the harmony of the result, and not one single color tone would correspond with any of the original. It has been said the color scale attached to the original and photographed with it at the same time offers a sufficient criterion to judge correctly of any possible fault in the negative, but practice has shown that it is not so. The correct alternate intensity proportions, upon which the qualitative relations of the printing surface depend, are quite frequently destroyed, and possibly so during the last operation, when a want of uniformity in the etched plate is perceptible.

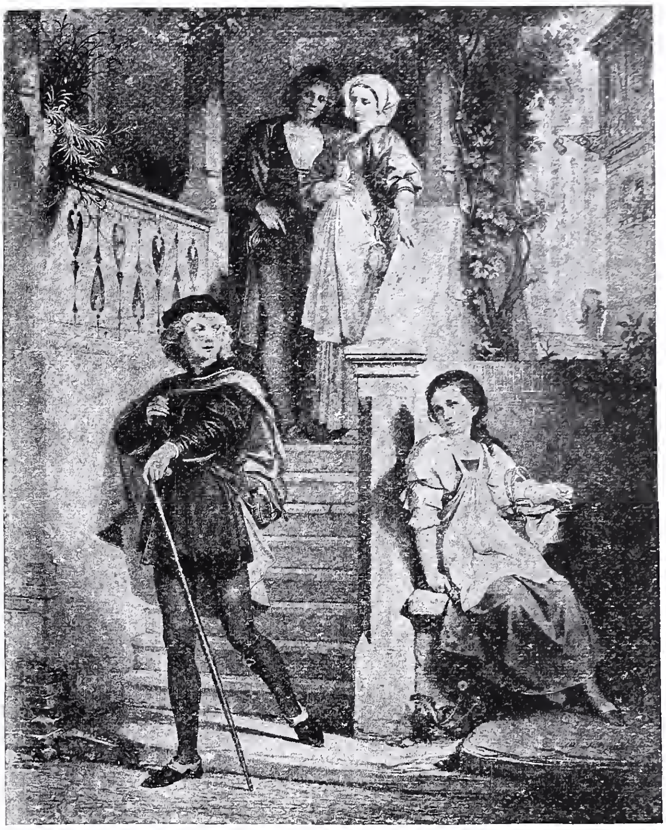


FIG. 2.—REPRODUCTION FROM A PAINTING.

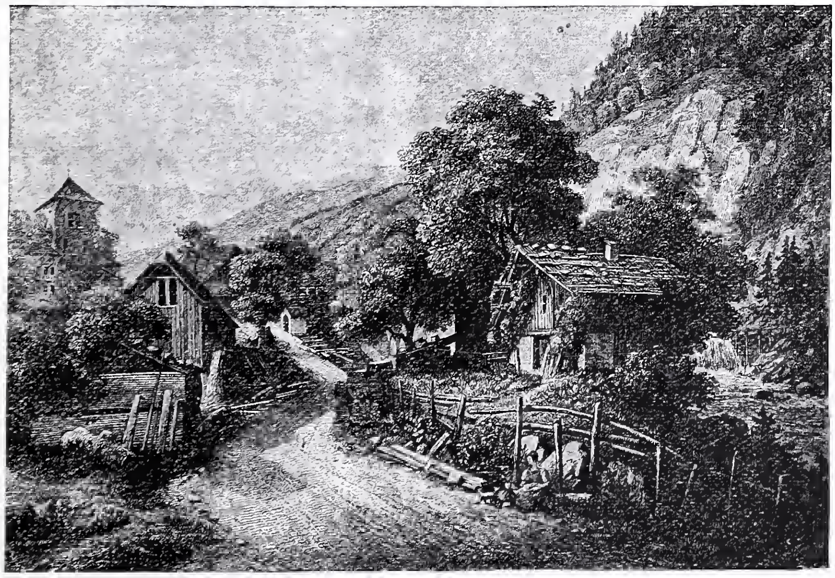


FIG. 3.—REPRODUCTION FROM A WOOD-CUT.

It is true this want of uniformity of the printing surface may be corrected to some extent by repeated after-etching, by retouching with the machine, etc., but all this requires a vast experience and leads but rarely to the desired result, not more so than to introduce into the print a fourth color, for instance, neutral gray.

With printing in a gray tone, the process ceases to be three color printing.

As the process is now perfectly well understood, we come to the conclusion that the result of all our photo-mechanical endeavors is purely accidental, and not more certain than that of a lottery, where one prize is drawn from 1,000 blanks.

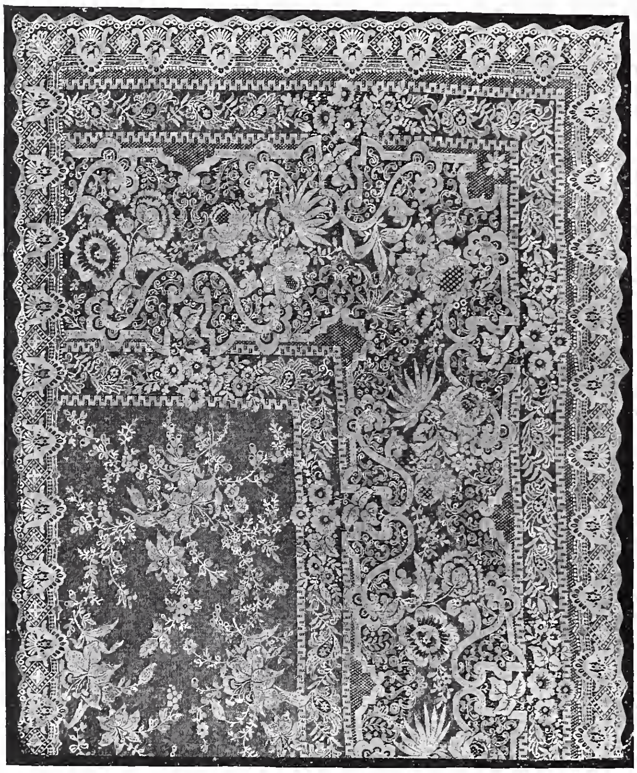


FIG. 4.—REPRODUCTION DERIVED FROM A PIECE OF LACE.

The best operator cannot be held responsible for failures. Now, let us ask, is there any possibility to eliminate these imperfections? Certainly not of principial nature, from the otherwise excellent and clever instruction of Ducos du Hauron?

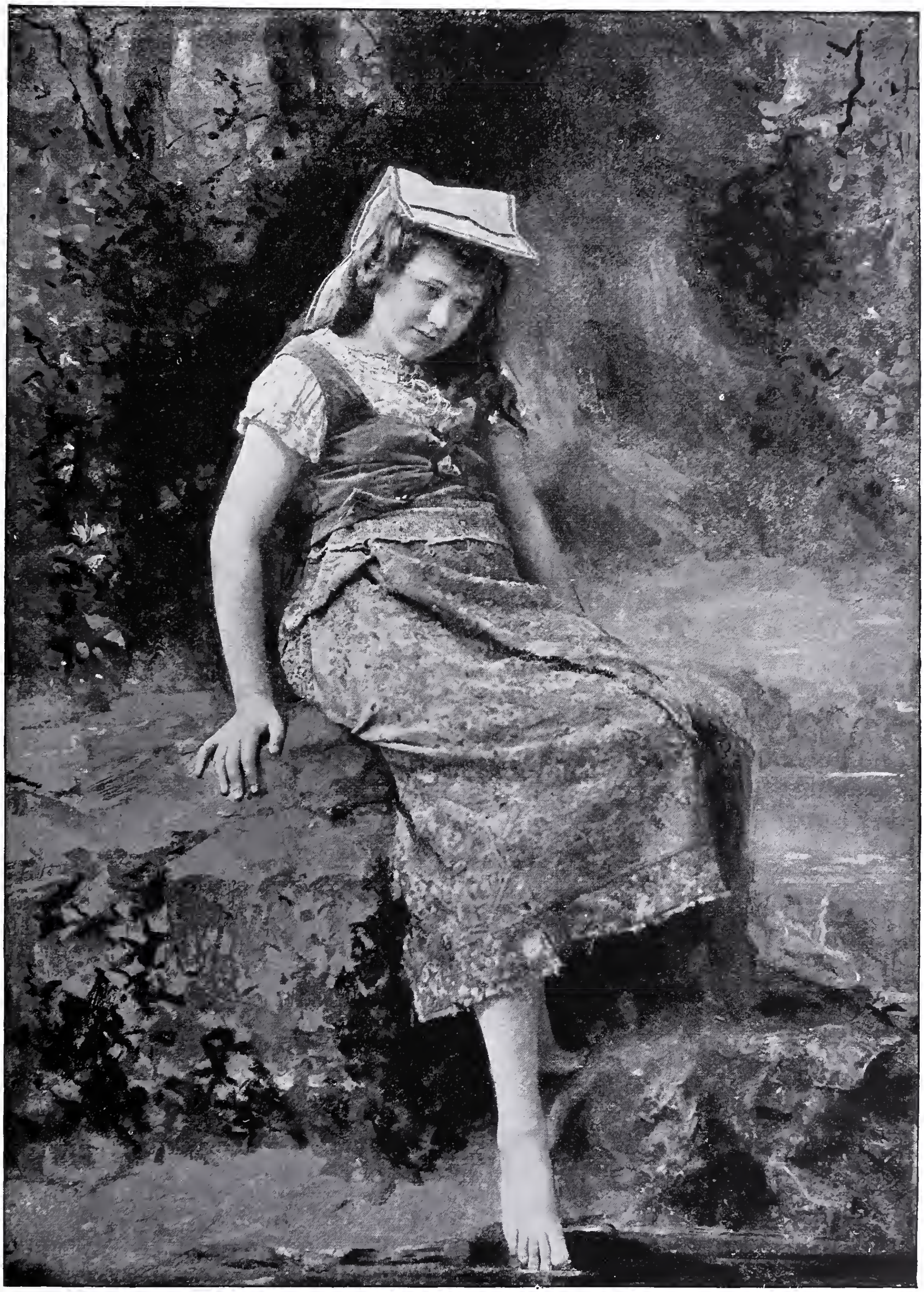
Evidently we will approach much nearer to our aim when we are able to prepare, directly for high relief etching, three orginal negatives, presumed to be color correct, without transferring them into diapositives and finally into Meissenbach plates. To make the first negative directly under the line screen can hardly be expected, unless the sensitiveness of our photographic plates be very much increased; but it would be an incalculable advantage for the perfection of three color printing, were it possible to make zinc relief plates directly from Meissenbach positives. Either of the processes may be made practical by adopting the methods suggested by me in the American Annual of Photography of last year.

The plates accompanying this essay are made from ordinary negatives without artificial grain. They are made from various kinds of originals by a method, contrary to the ordinary asphaltum or albumen processes, where those portions of the sensitive zinc plate having suffered a change under the action of light are etched. Complete three color prints made by this method, will shortly be presented to the public.

Perfect surety in three color printing will only be attained when we are in possession of an infallible criterion, not only, for the quality of the first negative, but eventually, also, for that of the reproduction, characteristic enough to show amateurs or professionals whether or not the negatives are of correct intensity, or whether one of the printing plates has a predominating printing surface, so as to produce on certain portions of the print neutral black or neutral gray. The only test hitherto at our command has been the finished proof. Three color printing will then be emancipated from its present experimental state, and enter many other valuable industries.

In consideration of the many forces devoting themselves to the perfection of the process and the solving of the problem, it is fair to suppose the desired end will be reached in the near future.

AFTER L. PERRAULT.



PHOTOGRAPHED FROM LIFE.

From "Sarony's Living Pictures."
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NATURE'S MIRROR.
BY NAPOLEON SARONY.

SOME PRACTICAL NOTES ON SILVERING ALBUMEN PAPER.

BY J. R. SWAIN.

A WHOLE size tray should be used, and not less than one sheet silvered at a time. The bath should be ample—80 ounces at least; better a gallon. The strength about 40 grains, neutralized with carbonate of soda. Two such baths should be kept on hand, one in the sun while the other is in use. The albumen paper should be kept straight, in a drawer for that purpose, and not rolled up. I have no faith in the old theory, to keep the paper moist. I have tried drying it bone dry before silvering, with good results, only a little more time was required.

Two minutes in summer and three in winter is about the right time to silver. Still there is no definite rule in the matter. In experiments I have silvered ten minutes with good results.

When the paper is first laid upon the bath, two sticks, the full length of the paper, and about one-half inch square, should be laid one on each edge of the paper to prevent its curling. The sticks can be removed in a short time, and the paper examined for air-bells.

In removing the paper from the bath it should be drawn over a glass rod, and placed between blotters untill every sheet is silvered. Then two sheets should be placed back to back, and caught at the four corners with clips and hung up to dry. In this way the tendency to roll up is avoided. When thoroughly dry it should be fumed till it prints black, not red. From fifteen to twenty minutes is sufficient. Sometimes, in winter, freshly prepared paper will print measly or spotted. The remedy is, to wait a little, Frequently paper that refuses to print in the morning will print all right by evening. I have never yet seen a sample of measly paper that refused to print all right the next day after silvering, and I know of no better remedy for such paper than a little time.

A whole sheet of paper can be doubled and cut to the proper size at once before printing. It is a useless waste of time to trim prints after printing.

It is bad practice to keep changing from one brand of paper to another. First find some good brand, and then stick to that.

From National Printer Journalist

OLD TRINITY CHURCH, STAFFORD-ON-AVON.

A MODIFIED KALLITYPE PROCESS.

THE process that in its results makes the nearest approach to the platinotype is probably that known for some time as the Kallitype. This process is not a new one by any means, although apparently but little used. It is based upon the fact that ferric oxalate is sensitive to light, being converted into ferrous oxalate, a salt having the power of reducing various metallic salts. At a recent meeting of the Photographic Society of Japan, Prof. W. K. Burton gave a demonstration of a kallitype process which may be said to be a modification of that introduced by Mr. O. P. Bennett.

The following is a description of the process:

Sensitizing Solution.

Ferric oxalate	75 grains
Silver nitrate	30 grains
Water	1 ounce

This solution is swabbed over the paper with a wad of cotton wool. The coating is, of course, made as even as possible, but streakiness that cannot be avoided does not, as a rule, show in the finished print. The paper is dried in front of a clear fire before the solution has time to sink into it.

Paper so prepared will keep for several days in any ordinary wrapping, for months in a calcium tube.

The quantity mentioned is enough to coat about ten square feet of smooth paper, five feet of extra-rough drawing paper.

Printing

is done in the ordinary printing frames, the time taken being about one-third that needed for albumenized paper. The image is visible, and has the exact appearance of the image in the platinotype process—in fact, it is of exactly the same nature—and any one accustomed to platinotype printing can readily judge when the paper should be taken from the frame.

Developer.

Rochelle salt	1 ounce
Saturated solution of borax	10 ounces

Restrainer.

A one per cent. solution of bichromate of potassium.

The effect of the restrainer is very marked. Without any of it the prints are liable to be "muddy" and to have impure whites. The least that is needed is seven or eight minims to each ounce of solution, and no more than this should be used for negatives such as are suitable for printing with albumenized paper or such as are at all hard. In printing from thin negatives, restrainer up to the extent of thirty minims per ounce may be used, the exposure being correspondingly increased. In this way it is possible to get brilliant prints from negatives too thin to give such by any other process.

The image develops from a pale yellow color to a full deep black in a few seconds, but if the print be at once removed from the solution it will be found that the high-lights are yellow. It must remain in the solution for at least a quarter of an hour. It is to be observed that no further actual developing action takes place during this time. Though the developer can be altered to suit different negatives, or even to a certain extent to compensate for error in exposure, the result cannot be modified in any way when once the print is in the developer.

In using smooth paper, a number of prints may be developed in the same solution, pouring the developer into a measuring-glass as soon as one print is developed, placing an undeveloped print on the top of this latter, and returning the developing solution, the prints being afterward kept moving just as in the ordinary toning process. In using very rough paper, however, this procedure is not permissible, as the image gets rubbed from the tops of the roughness of the paper, with the result of a mottled effect.

After development, the prints are washed in three or four changes of water, and are then placed in the

Fixing Bath,

consisting of a one per cent. mixture of the strongest ammonia and water, where they remain for about a quarter of an hour. Washing for half an hour completes the process.

PHOTO-TINCTURE.

BY P. C. DUCHOCHOIS.

A SHEET of paper, a tissue, is dipped in a solution of ammonium bichromate and of ammonium vanadate; the latter salt is added to obtain a more energetic mordant:

Water	1 ounce
Ammonium bichromate	250 grains
Ammonium vanadate	25 grains

The material should be dried in the dark-room at a temperature not exceeding 75 deg. Fahr., for at 85 deg. the transformating action already commences and manifests itself by tinting the whites and veiling the image.

The prepared paper or tissue is exposed under a negative cliché and, after an exposure-time which varies according to the nature of the cliché and the state of the light, one removes the proof from the printing-frame, when all the details of the image appear strongly impressed, and then washes thoroughly to eliminate every trace of the chromium salt not fixed. In that state the proof can be dried and kept for the subsequent operations, and it will suffice to wet it in warm water to proceed to the tincture, which is done in the following manner:

The proof, well rinsed, is immersed in the coloring bath and this is gradually heated to boiling, temperature which it is necessary to maintain during fifteen or twenty minutes; the proof is then thoroughly rinsed, and, if the whites are not entirely pure, it is passed in a warm bath of soap and carbonate of soda, or in a cold bath of chloride of lime to which is added a few drops of hydrochloric acid. The proof is finally rinsed, then dried.

When one has recourse to the chloride of lime, it of all necessity to eliminate every trace of chloride by a bath slightly alkaline before drying the proof.

The coloring products employed for dyeing are mostly derived from enthracine. They are:

The *artificial alizarine* is sold in commerce under the name of *alizarine for violet*, *alizarine for red*. Alizarine for violet is an alizarate of sodium whose formula is $C_{14}H_6(ONa)2O_2+H_2$ Alizarine for red is a mixture of isopurpurine and of flavopurpurine with greater or lesser proportions of alizarine.

The alizarine for violet gives a violet red with the mordants of chroma and of alumina, and a violet blue with iron.

The blue of alizarine S ($C_{17}H_{11}\,{}_{1}No_{10}\,S_2\,Na_2$ imperial formula) is a bisulphited preparation of blue of alizarine or dioxyanthraquinone-quinoline.

The black of alizarine S, whose empirical formula is $C_{10}H_7So_7Na$ is a bisulphited preparation of napthazarine dioxynaphoquinone.

The black of alizarine R, naphtazarine not bisulphited, is a product which may contain a mixture of other alizarine colors.

The galloflavine, supposed formula $C_{18}HN_2O$, is a preparation obtained by oxidation of gallic acid and whose chemical constitution is not yet well determined.

The purpurine $C_{14}H_8O_5$ trioxyanthraquinone.

The brown of anthracene (anthogallol).

The orange of alizarine has for formula $C_{14}H_7NO_6$ (B–mononitro alizarine).

The yellow of alizarine A must be (?) a gallocetophenone.

The chestnut of alizarine. Constitution not well known.

The green of alizaine S and *blue indigo alizarine S* are transformations of blue of alazarine. Constitution not well determinated.

The galleine is a product from the oxidation of pyrogallophtaleine.

All these products can be mixed and furnish a series of very fast tints, resisting to the action of light, of the alkalies and of the acids. And fixing themselves only on the parts where the mordant is fixed and according to its concentration, it is therefore certain that the parts not impressed by the action of light will give the whites, unless one has employed impure products, or made some mistakes, either by having dried the tissue or the paper imbued with the sensitive salt in a place where penetrated some white light, or by having neglected to charge the printing frame by the red light, or again by not having completely eliminated the chromium salt before proceeding to the tincture. But these proofs present a great resistance to chemical actions; one can by dipping them, when finished, in a solution of chloride of lime (as before indicated) obtain perfectly pure white.

The quality of the tissue and especially of the paper has a great influence on the results, for the colors fix also themselves under the action of the mordants of aluminium, iron, copper, and other metallic products, and give different tints, according to the product employed. It is thus that I could obtain by means of paper holding alumina and chrome two different tints with alizarine black. In the parts where the chromium salt had been transformed into mordant, I have obtained the black; and, in the parts not mordanted, the rosy-gray by the salt of aluminium impregnating the paper.

The applications, says Mr. Villain, who devised the process, are numerous, not only for the amateur photographer, but also for the manufacturer. One can employ it for the obtention of colored images on paper or tissues for fancy articles, such as fire-screens, folding screens, fans, window-shades, curtains, panels for apartments, fabrics for furniture, etc., etc. The cost is indeed very small; for one or one and a half dollar one can dye 20 or 24 pounds of tissue or paper, which represents about from 1,500 to 2,000 proofs 5 x 7 inches.

◆

Union Photo-Engraving Co.

A POSE.
BY NAPOLEON SARONY.

PHOTOGRAPHED FROM LIFE.

From "Sarony's Living Pictures."
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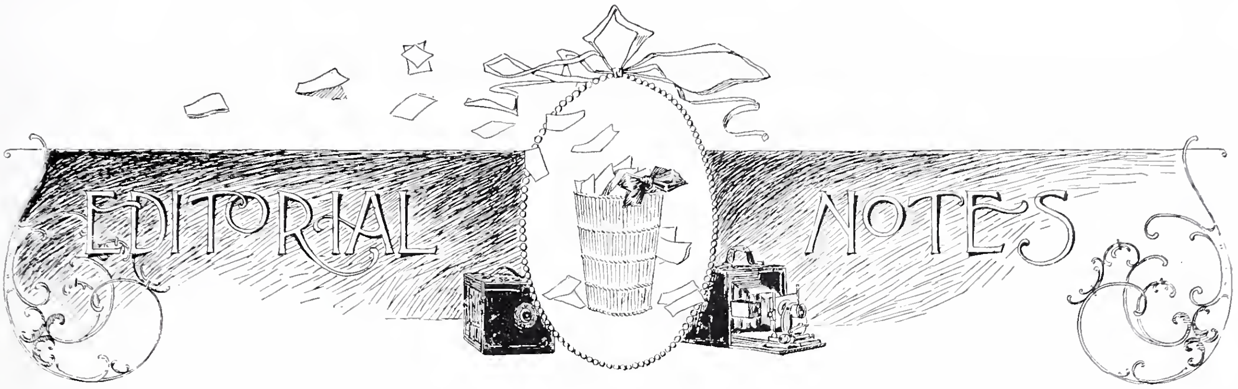
"FINISHING TOUCHES."
BY NAPOLEON SARONY.



EDITORIAL NOTES

WITH the exception of about three or four copies, the whole edition of the February number of the magazine was sold out within a week from publication, and this notwithstanding the fact that over five hundred extra copies were printed. We cannot but feel highly gratified at these results, which will undoubtedly encourage us to further efforts.

* * *

"ONE of the most remarkable singularities of the present phase of scientific thought is the support it seems to give to spiritualistic theories," says a contemporary. "The inconceivable or unthinkable realities which scientific men have now got to reason about in connection with the functions of the ether, dispel the old idea, that conceivable 'solid' atoms form a sufficient basis for the construction of the universe. Materalism, in the old sense of the word, is absolutely disposed of. Since then, science brings to our knowledge the existence of non-material things which, from their nature, lie outside the limits of any possible human experience, what rational ground is there for affirming that disembodied spirits, or spirits originated independently of matter, may not exist hitherto unknown to us, or but dimly and imperfectly recognized? By one very learned school of scientists it is claimed that there is no such ground. And the specific degree of support thus given to our religious idea of immortal life may serve to account for that recrudescence of puritanism which has been commented upon within the last three or four years."

WHILE there is undoubtedly much truth in this statement, yet at the same time it is necessary to be very cautious in accepting new theories without substantial support. Spiritualism has unfortunately opened such a lucrative field for the swindler anxious to prey upon the weaknesses of his fellow creatures. So many wealthy men have already been stripped naked of all worldly goods by these rascals.

VERY MUCH has been written upon the subject of so-called "spirit photography," and we have pleasure in giving in this issue some reproductions of pictures which are supposed to be genuine, together with a description of how they were made by Mr. Meredith B. Little, a well-known spiritualist.

In criticising these pictures, we will do so from a purely photographic standpoint. Mr. Little has been kind enough to send us several photographs, some of which are referred to in his article. Unfortunately, the indistinctness of some of the "spirits" was such that they would have been almost entirely lost in a half-tone reproduction. These pictures can, however, be inspected at our office by any one interested in the subject. It will be noted that Mr. Little, in his communication, confesses to his ignorance of the art of the photographer, a fact which has in all probability been taken advantage of by the "spirit" photographers. As our readers are aware, there are a dozen methods of producing these "spirit effects," some of which (for instance, the use of fluorescent or phosphorescent substances), can be obtained without the slightest knowledge on the part of the sitter.

A close examination leads us at once to the conclusion that these pictures are produced by one or other of the artificial means at our disposal. Our reasons for these conclusions we will give in a few words. In almost every picture the "spirit" of the Princess Wynona appears, and although some of them were taken at different periods, *the pose and lighting are exactly the same in every case*, an effect that could only be obtained by photographing a ready-made image. A careful scrutiny of one of the pictures under a microscope shows it to be a photograph of a drawing, and a poor and clumsy one at that.

If we are to accept "Princess Wynona's" version of the process by which these spirit forms impress themselves upon the plate we may as well destroy all our treatises and textbooks upon light, for it completely violates all present theories. We would point out that a luminous or a semi-luminous body emitting sufficient light to affect the plate in an absolutely dark room, *cannot throw shadows on itself*. The faces of the spirit forms are undoubtedly illuminated from an outside source, but under the circumstances detailed we fail to see where this light came from.

* * *

REFERRING to the question of photographic standards, particularly in relation to screw fittings for lenses, *Photography* says: "In England, owing to the Council of the Royal Photographic Society some fifteen years back, standard screw fittings are now pretty generally adopted by our lens manufacturers. In the United States, however, matters remain as they originally were, and if we can succeed in bringing America and England into line in this matter, not only will much international good accrue, but the American photographic public will be immensely the gainers. In this connection we wonder how many of our American readers are aware that the American Institute in New York is in possession of a set of standard screw fittings which were recently presented to it by the Council of the Royal Photographic Society of England. Thus American manufacturers of lens mounts have at hand all the information requisite to enable them to work uniformly with us."

* * *

ON inquiries at the American Institute we found that this handsome gift of the Royal Photographic Society had only just been received, in fact, had not as yet been unpacked. The delay has, of course, been occasioned by the red tape routine of the Custom House.

* * *

HERR SCHERING has taken out a patent for the manufacture of orthochromatic films by the aid of formic aldehyd. We were one of the first to point out the uses of this substance in photography. It is far superior to the salts of alumina as an insolubilizing agent. Schering's method is this: He first coats a plate with a 20 per cent. solution of gelatine containing 3 c.c. of a 36 per cent. solution of formic aldehyd. This, when dry, forms a perfectly insoluble film, and upon this he coats his orthochromatic gelatine emulsion. The action of the formic aldehyd, like that of alum, is a continuous one, and it also renders the orthochromatic film insoluble without affecting its color sensitive properties. Over four months ago we suggested to one of our leading dry plate makers the advisability of employing formic aldehyd in the substratum to render the emulsion insoluble.

* * *

PROF. DEWAR recently gave another interesting discourse upon the subject of Phosphorescence and Fluorescence. He stated that he had recently been carrying on some experiments in conjunction with Captain Abney as to the effect of light upon sensitive gelatine films at very low temperatures, as compared with the effect of the same light upon similar films at the normal temperature of the air. To show those present that the low temperatures have an influence over photographic action, he exposed a piece of white chloride of silver to light, close to the condenser of the electric lantern, and continued to paint liquid air over one portion of the piece of paper; that portion remained white, while all the rest of its surface darkened under the action of the light. At the lowest temperatures they could get with photographic films, there was still twenty per cent. of sensitiveness left, and this was a large amount; therefore, they could only hope by exact experiments at different temperatures to get a curve which might possibly point in the direction of minus 274 deg. Centigrade, the absolute zero of temperature. When chemical development was employed with chloride of silver paper, the results were the same as in the last experiment.

"How," said Professor Dewar, "can chemical action—if it is chemical action—take place at these low temperatures?" The question is, he added, whether it is physical or chemical, for it must be remembered that no water is present at that temperature, consequently it may be a physical change. It may be, he added, that in the end phosphorescence will be found to blend into photographic action.

One of the experiments, described by the aid of a diagram, was the exposure of two small gelatine plates, the one in common air at the normal temperature, and the other in liquid air, to the same light falling upon both from above, so that the rays would not have to pass through glass. Upon the face of each plate was a screen with a hole in it, and on development of the plates in the same dish, an image of the hole came out upon each, strongly upon the plate exposed at normal temperature, and much weaker upon the plate at the temperatures of liquid air or oxygen.

* * *

THE three-quarter photographs which we leave behind at the present day, faked up by the photographer's art, will be useless to the man of the future as records to tell what manner of people we were, says S. S. Buckman in the *Nineteenth Century*.

With lapse of time, the widening of the family circle, and the various incidents of workaday life, it is doubtful if these pictures will be regarded with any reverence or affection by our posterity from a merely sentimental point of view.

But this would be changed if photographs were, as should be all photographs which aim to give a true picture of the face, taken just two ways, profile and full face. They would thus be of scientific value, and even a dilettante scientific amateur of the future would esteem a family collection as something of interest for the lessons in evolution or anthropology it might teach.

The want of such photographs at the present day makes it extremely difficult to impress upon the layman or to prove to the scientist how much people change facially during life. Three-quarter views give but a feeble idea of the development.

Nothing is more remarkable than a comparison of the same sized profile views of the same person at 6 and 30 years of age; the growth of the nose and the development of the forehead are so great that the jaws appear to have diminished in size, and this is really what the jaws have done in proportion to the whole face.

* * *

THE *British Journal of Photography* expresses the opinion that photographers might add to their income by using more colored work, not the gaudy, elaborately painted work, but just tinted "sufficient to indicate that a person is not sallow and cadaverous, but has a face glowing with ruddy health, or to show that one's moustache or beard is not the black it purports to be, but is brown; and so on."

Powdered colors are recommended for mat gelatine prints. Their application is made in a surprisingly brief period of time, and when the superfluous powder is dusted off it is difficult to tell by what means the coloring has been applied, the photograph appearing as if carefully worked by a skillful miniature painter. Colors will adhere to the mat surface with considerable tenacity.

* * *

AT a recent meeting of the Geological Society of London, J. Bridges Lee described a new instrument for surveying by the aid of photography, and made some observations upon the applicability of the instrument to geological purposes, says *London Invention*.

The instrument consists essentially of a photographic camera fitted inside with a magnetic needle, which carries a vertical transparent scale divided and numbered to 360 degrees, and also with cross fibres which intersect at right angles. The fittings and adjustments of the instrument are of such a character that the camera can be accurately leveled and directed toward any point in a horizontal direction, and when a photograph is taken in an ordinary way the bearing of the median vertical plane which bisects the instrument through the photographic lens will be recorded automatically on the face of the photograph. The vertical fibre (and its image on the photograph) serves as an index to read the bearing; and the same fibre marks by its shadow a line right across the photograph, which marks the median vertical plane on the image. The horizontal fibre is adjusted to mark on the image the horizontal plane which bisects the photographic lens. The camera rests on a divided horizontal circle, which can be adjusted to a truly horizontal position by leveling screws. There is a tripod stand and head, with suitable appliances for supporting and adjusting the instrument in position. The camera is provided with a rectilinear doublet lens and iris diaphragm and rack and pinion focusing adjustment.

It is made of aluminum; and is surmounted by a telescope adjustable in altitude and fitted with vertical and horizontal webs; and is also surmounted by a revolvable tubular level.

* * *

THE accompanying photograph of the partial eclipse of the moon on September 14 and 15 last, was made by Mr. William R. Brooks, of Smith's Observatory, Geneva, N. Y., with the 10-inch equatorial refractor of this observatory, with photo correcting lens placed in front of the visual objective. Mr. Brooks, writing to *The Scientific American*, says: "The diameter of the moon's image in the principal focus is about one inch, which is enlarged by a positive photographically-corrected enlarging lens to four and one-half inches. This enlarged image is taken direct in the telescope at the time of exposure.

"The time of exposure for this negative was two seconds. The driving clock of the telescope was regulated to lunar rate, so that the moon's motion was accurately followed.

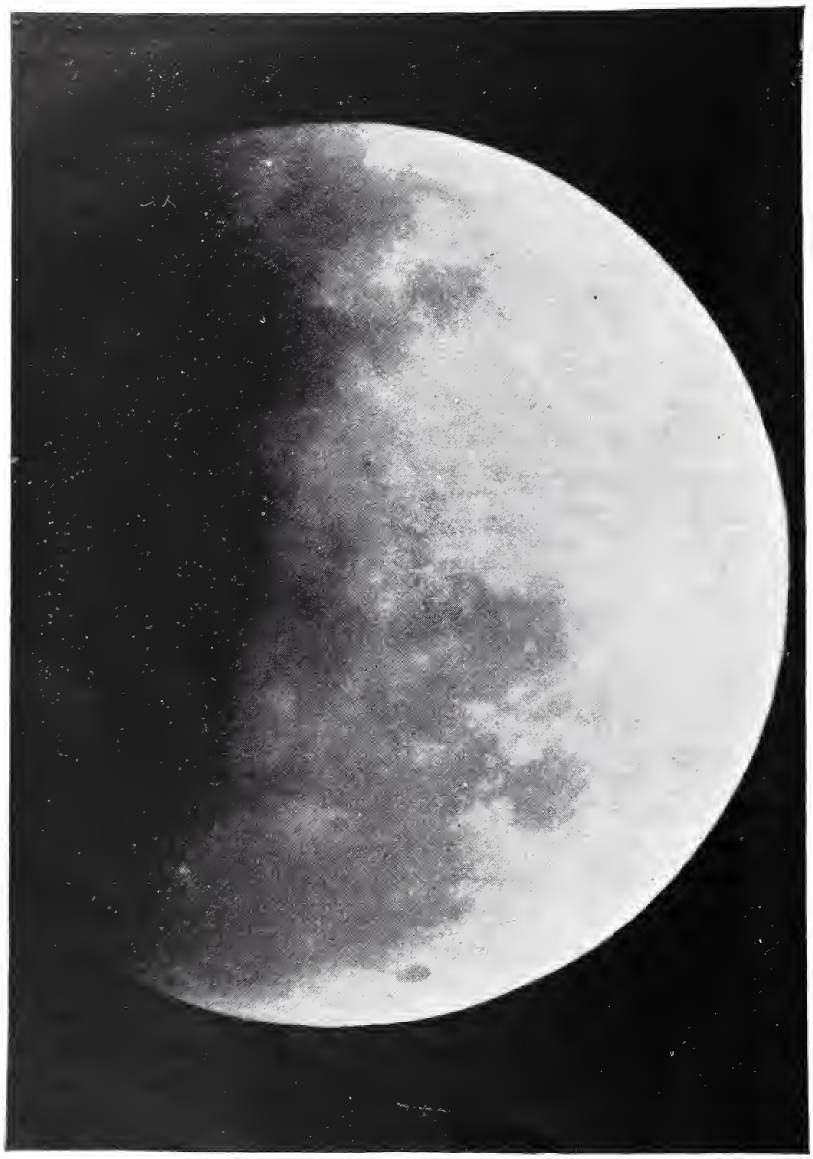


Photo by W. R. Brooks. From "The Scientific American."

THE RECENT PARTIAL ECLIPSE OF THE MOON.

"This photograph was made at the time of greatest obscuration, or half-past eleven, and shows the diffused circular outline of the earth's shadow."

* * *

IN our last issue we published an interesting article by Prof. Nordenskiold, on the subject of photographing snow crystals, an article which has, we believe, led many of our readers to experimenting with this fascinating study. The necessity of standing out in the air with the temperature many degrees below zero has no doubt dampened the ardor of some enthusiasts, who have preferred to sit by the warm fireside and read and see what others have done.

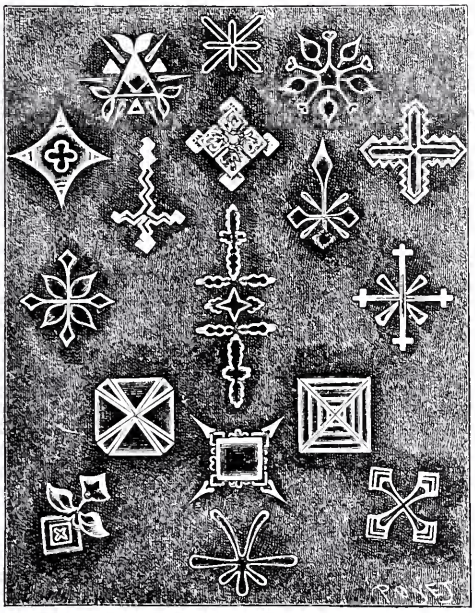
The study of crystallization is undoubtedly an interesting and fascinating one, and photography may be made to play an important part in securing permanent records of these curious formations. If a drop of water containing a salt be allowed to drop upon a glass plate it will, on evaporation, deposit crystals of various kinds. In a recent article in *La Nature*, by Dr. E. Trouessart, a description is given of the beautiful crystallic forms deposited by a drop of ink on evaporation. The article is translated in the *Literary Digest*, from which we make extracts:

"Take a sheet of glass, deposit on it a drop of ink and spread the drop a little, uniformly; let it dry for a few minutes; then examine with a microscope, magnifying from 50 to 200 diameters, and you will be able to see the flowers of ink in process of formation under your eyes; that is to say, regular white crystal particles which detach themselves from the black or violet medium, and arrange themselves so as to form regular figures.

"If you are pressed for time, this beautiful result will easily be obtained by passing the sheet of glass over a spirit lamp or a candle to evaporate the moisture. The crystals will then be smaller and more numerous, presenting the appearance of a dark firmament densely sprinkled with bright silvery stars. But if you have patience to wait for evaporation without heat, you will obtain larger crystals of more varied forms, arranging themselves as crosses, flowers, etc.

"These crystals may be varied indefinitely by modifying the conditions of evaporation, adding more ink, etc. But it is quite possible that different inks will give different results. The inks I use, like all the other inks in use, have a basis of sulphate of iron and gallic acid.

"By allowing the evaporation to proceed slowly, it is quite easy to watch the formation of the crystals. The geometrical figures are more or less perfect cubes, pyramids, lozenges, crosses, needles, etc., the pyramids being formed by cubes superposed one on the other, as in the pyramids of Egypt. The *flowers* in our illustration are formed by the union of crystals, each of which represents the petals or sepals of a flower. The Maltese cross—the crucifer or four-leaved flower—is the normal regular form, but multiples of four frequently occur, by the formation of new crystals in the intervals; and also, by the accidents of crystallization, we get flowers of three and five petals, resembling the *Rubiaceæ*, lilies, orchids, violets, etc.



From the *Literary Digest*.

INK-CRYSTALS, AS SEEN THROUGH A MICROSCOPE.

"If you now ask me what are the salts of which these ink crystals are composed, I must answer: 'I know nothing.' We know what goes into the ink, but we do not know what are the chemical reactions. All that we know is that the crystals belong to the system of cubes, that they do not polarize light, and that they deliquesce, on exposure to the air, but slowly."

We recently had the pleasure of viewing the beautiful examples of tri-color photography made by Mr. R. D. Gray, of this city. A large number of views taken in various parts of California were projected upon the screen. Every one was greeted by the audience with loud expressions of delight. Mr. Gray has kindly given us some account of their production, with an illustration of his projecting apparatus. These will be found on another page.

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The Poulenc Brothers, in *Le Moniteur Photographic*, note some experiments they have made with a view to the restoration of platinum prints which have become yellowed from the mounts or the mountant, or from other causes. Of the various substances tried, hypochlorite of sodium gave the best results. The print, removed from its mount, is placed in a solution of 5 parts of hypochlorite of sodium to 100 parts of water. The bath is renewed from time to time until the whites become perfectly clear.

The print is then washed carefully, adding to one or two of the washing waters a few drops of hydrochloric acid, to neutralize any hypochlorite which may be contained in the paper. The prints were proved to be perfectly unalterable under this treatment, special experiments with prints cut into parts having shown that under this treatment they lose none of their fineness or detail. The hypochlorite also removes ink stains, and in the case of grease marks, by placing a cushion of tissue paper under the print, then soaking the spot with benzine and placing another pad of tissue paper over it, pressing it firmly the oil is absorbed by the tissue paper—the operation being renewed if necessary several times—afterward the print is plunged into the bath of hypochlorite. The authors state that they know of no printing process except those in platinum and printing inks, engravings, etc., which will stand this treatment. They recommend that much care should be exercised in the selection both of the paper for coating with platinum, and also of the cards for mounting.

* * *

DANIEL C. CHAPMAN.

BY O. G. MASON.

When the doors of the study-laboratory, or shop, of a busy worker in a chosen field of human industry are closed for the last time, and he has gone out to join that great majority, where all must sooner or later follow, the record of his earthly journey may teach us a lesson of more than passing interest. This may surely be said Daniel C. Chapman, who went out of human existence on December 3d.

From early manhood to the end his labor seems to have been guided by singleness of purpose, that each succeeding step should be higher than its predecessor.

He was born at South Corinth, Vermont, October 27, 1826, and doubtlessly inherited his mechanical skill from his father, a progressive farmer of the district, who made his own improved implements of labor. Young Chapman earned, by farming in summer, the money with which to pay for his schooling in winter, until his graduation from Bradford Academy. After teaching school several winters he went to Manchester, New Hampshire, then fast becoming a mechanical centre, where he learned the machinist's trade.

In 1852 he came to New York, where he found a wider field for his inventive skill, one of the first results of which was the first button-hole sewing machines ever made. He once told the writer that when sewing machines were selling for sixty and one hundred dollars each, they were in their mechanical parts furnished to the dealer by him for three dollars and seventy cents

His sewing machine business took him to California in 1856, from whence he returned to New York in 1858.

In 1863 he began his photographic work by purchasing a small gallery in the upper part of the Bowery, where he was one of the first to experiment with bromide plates. His skill in mechanics and with the camera became so well known that in 1868 he was engaged by the late Lewis M. Rutherfurd as one of the assistants in his private observatory, at Eleventh Street and Second Avenue. Here he was brought in contact with many of the leading minds in science, while his inventive genius and mechanical skill contributed in no small measure to the production of some of the most wonderful photographic work for which that observatory has been justly celebrated. His work in rendering the plates more sensitive, and the skillful development of a weak image, are matters of astronomical history, while his ruling of glass plates as gratings for spectro work won for him a world-wide reputation.

In 1870 he was chosen photographer to the United States expedition for observing the total eclipse of the sun, and returned to his work at the observatory in 1871.

In 1878 he married Carrie R. Sullivan, of Port Chester, N. Y., whom he has left comfortably provided with a pleasant home in Washington.

In 1879 Mr. Chapman was engaged by the late Henry Draper as his assistant in his photographic investigations in spectral analysis and the constitution of the sun. After Dr. Draper's death Mr. Chapman accepted a position, which had long before been tendered to him, as chief photographer to the United States Coast and Geodetic Survey at Washington. There his mechanical skill and love of science kept him some time in the Bureau of Weights and Measures, from which he went to his last position of photographer, to which was soon added the further duty of electrotyper. His devices for making and mounting photographs to exact scale—a very important feature in map work—are ingenious and work satisfactorily, while as electrotyper he produced better results and at less cost than any of his predecessors. In a recent letter from the Department I read: "In his responsible position Mr. Chapman acquitted himself with great credit. It will be a very difficult matter to fill his place and his departure from among us is a source of deep regret." To the writer of this brief notice his loss is felt to be not only as a co-worker, but as that of a true and earnest friend, one who has done much for photography and no little toward the advancement of his fellow-men.

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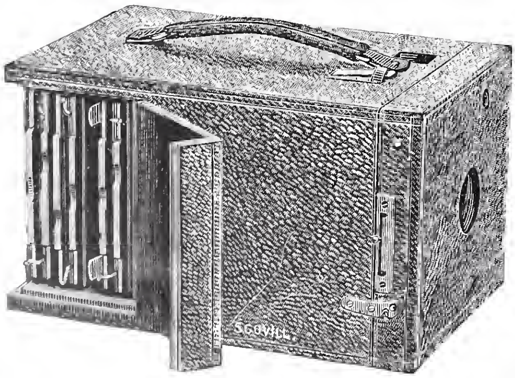
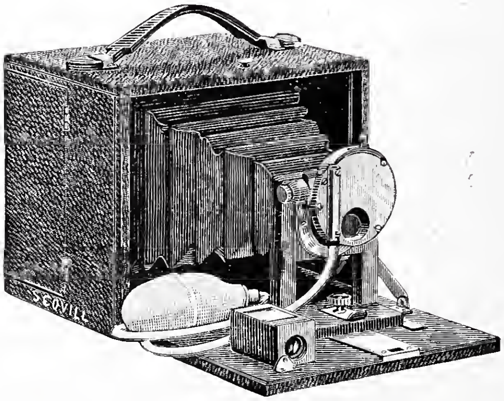
TWO NEW CAMERAS.

We wish to call the attention of our readers to two new cameras recently emanating from the works of the well-known American Optical Co.



The first is called the New Waterbury, and sells for $15. To all outward appearances it is the equal of the original Waterbury, which sold for $25, as will be seen from the above cut. It contains a safety shutter, with speed regulator, an excellent lens, with focus adjustment on top, carefully regulated to a scale, an accurate view finder, and three double plate-holders, carrying six plates. The box is leather-covered, and may be used



either in the hand or on a tripod. It is a camera which is sure to be popular with the amateur.

The other camera is the Henry Clay 2d, and, as its name indicates, embodies the principle first employed in the well-known Henry Clay, viz., the folding idea. This camera contains a new (Safety) shutter, very neat and attractive, with speed regulator, capable of making time or instantaneous exposures, and with pneumatic release, an excellent lens, a reversible view finder and two plate-holders. It may also be used on the tripod for deliberate work, or in the hand as a "snap-shot" camera. It is leather-covered, and the wood-work is especially attractive in its ebonized finish. This camera includes two very neat double plate-holders, a bulb and tube for the pneumatic shutter, and sells for only $20.

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MECHANICAL DEVELOPMENT.

BY F. S. LEWIS.*

One of the first desires felt by those who take up photography to the extent of developing the negative as well as pressing the button is, that some way might be devised of holding back the development of the high-lights while the details in the shadows are being built up. In developing one of two plans is usually followed. The one consists of mixing the developer in certain proportions and then using it for all plates indiscriminately, while the other plan is to manipulate the developer to suit the requirements of the particular plate being developed.

The first method is based on luck, and the results are good or bad according to whether the mixture happens to suit the plate and exposure or not. The usual directions regarding the latter mode of developing are that a weaker developer than normal shall be used as a base, and to it shall be added old developer or bromide to restrain, pyro or eikonogen to give strength and density, and an alkali to bring out detail

The principal objection to this method, however, is, that after a half dozen plates have been developed, the product in the developing dish is like hotel hash—full of useful ingredients, but in what proportions no one but an analytical chemist can determine.

When a plate is under-exposed, and less pyro and more alkali is added to bring out the detail, it frequently occurs that the details which show in the developing dish either partially or altogether disappear in the fixing bath, leaving only a slight trace on the film. This is due to the fact that the reduction made in the amount of pyro for the purpose of giving less density to the high-lights causes an absence of real strength in the detail in the shadow. For more than a year I have found that much better results can be obtained in developing plates by adopting the following method:

The exposed plates when taken from the holder are immersed in cold water in winter and in ice water in summer, where they are allowed to remain for three or four minutes, until the film and glass are chilled. The developer is prepared on the basis of normal exposure, and if made from powders is mixed with ice water, or if in fluid form is submerged in a thin glass bottle or vessel in ice water, until it is much cooler than ordinarily used. When the plate is placed in the developer the action is restrained by the cold developer, so that in event of an over exposed plate being immersed the same result is obtained as by the use of bromide or other restrainer. If the plate has received either a normal or under-exposure the high-lights will first appear slowly, and the moment they begin to show the plate should be lifted horizontally out of the developer and allowed to rest in an empty tray with ribbed bottom. The plate should allowed to rest in this position until the point is reached where it would otherwise begin to dry on the surface, when it should be immersed for a moment and again placed in the same position. This should be repeated until all the detail is developed, when the plate can be placed for a short time in the developer for a general increase in density. The only precaution necessary to be observed is to have sufficient developer in the tray to immediately cover the negative, which should be immersed by lowering it from one end, thereby allowing the developer to sweep over it. By this method of manipulating the plate it is possible to force out the details of the shadows without making the high-lights too dense. Attention has been called in the past to the value of exposing the plates to the air during the process of development, on account of the increased action of the developer, due to the oxygen of the air; but this will not explain the fact that under this process the high-lights are restrained and the details in the shadows built up. When the plate is raised from the developing fluid there is immediately overlying all portions of the negative a very thin film of developer. Where the high-lights underlie the developer a rapid chemical action is at once started, and the strength of the developer exhausted. Where shadows underlie the developer the action is slow, and the developer exerts its full strength on the slight impression made by the light. The entire plate is subject to the action of the developer, which is exhausted at different points, proportionately to the action of the light on such points, during the exposure of the negative in the camera. On this account it is only possible for the high-lights to be affected to the extent of the energy in the developer immediately overlying such high-light, while the shadows are practically subject to the continued action of the full strength of the developer.

If, for the sake of illustrating the method, it is admitted that the energy of the developer overlying the high-lights is exhausted in say one-third of the time the plate is out of the developer, then the result is equivalent to giving the shadows three times the effect of the developer as compared with the high-lights.

In developing plates over-exposed in some parts, and under-exposed in others, good negatives can be obtained by developing one part or the other to a normal condition, and, after fixing and drying, coating the portion of the plate which is satisfactory with Carbutt's roxyline and then reduce or intensify the balance of the plate, the coated portion being unaffected during the process. The roxyline can be applied around the edge of portion to be covered with a camel-hair brush and balance covered by flowing the preparation. In instantaneous views of scenery it sometimes happens that the faces of those who may be introduced to give the picture life are too much on the brunette style to suit either the subject or the photographer. By coating all the plate except the faces they can be improved by intensification.

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*Read before the Photographic Society of Philadelphia.

The natural tendency of keeping the plate so much in the air is, especially in summer, to raise the temperature, which decreases the crispness of the image. By keeping the developer cold this is corrected. A piece of pasteboard placed between the developing dish and a ruby lamp prevents any trouble from fog. Another advantage in this form of developing is, that two plates can be developed at the same time with little difficulty, as one or the other of them can be kept out of the developer.

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THE MECHANICAL PART OF LANTERN SLIDE MAKING.

By C. R. Pancoast.*

It may seem superfluous on my part to call your attention to so trivial a subject as the matting and mounting of lantern slides, and my excuse must be that, while for many any explanations would be out of place, yet there are some to whom a word of advice will not be unwelcome. I wish to call your attention particularly to the purely mechanical part of the work. In this I include the various adjustments of the camera, negative and plate holders, the making of the mats, and binding. It is an absolute rule that the centre of the picture on the slide *must* coincide with the centre of the glass, no matter what may be the shape of the mat opening. The reason for this is, that to secure the best definition in the lantern the centre of the slide must be in the optical axis of the instrument, all lanterns being made and adjusted so that the centre of the slide carrier is coincident with this axis. In providing a camera with which to make slides, the operator should look to the various adjustments needed. First of all, the focusing screen and the plate holder must register absolutely, otherwise sharp slides are an impossibility. Focusing should be done with a magnifier, and the slide must be just as sharp as a lens will make it. Second, there should be two movements to the carrier holding the negative—one a vertical and the other a horizontal; where such are not provided, the same results may be obtained by mounting the lens on a double-sliding front board for convenience in manipulation; this latter plan is preferable. Without these adjustments it is impossible to properly centre a slide. Now find the exact centre of the sensitive plate as it is carried in the plate holder and transfer that point to the ground-glass focusing screen. From this centre lay out accurately the various shapes of mat openings, drawing the lines carefully on the ground-glass with a lead pencil. It will thus be seen that if the work is carefully done an image focused on the ground-glass within the lines marked will occupy the exact centre of the sensitive plate. With these lines it is very easy to adjust the image by means of the vertical and horizontal movements of the negative carrier, so that the negative, or any part of it, may be brought to the required mat opening and be absolutely centred on the plate. Now as to mats. The usual form of mat made of black enameled paper with gilt lines has been sanctioned by usage, but to my mind, the ideal mat is made of a heavy paper, white on one side and black on the other. On the white side (which is always placed next the condenser in the lantern) is written or printed the title and any other data which may be desired; also the maker's name, and in the lower left hand corner a "thumb mark," to denote the proper position to place in the lantern carrier. Over this mat is placed the cover glass, thus protecting the writing and avoiding the necessity of an outside label. To the lantern operator the readiness with which the white side may be distinguished, and the ease with which the titles may be read when necessary, in the dim light of a darkened room, are great sources of satisfaction. From the lanternist's standpoint all pictures should be uniform in size and shape, so that they will "dissolve into" each other perfectly. To do this the regulation mat has an opening very nearly square, with rounded corners. This is all very well, but from an artistic standpoint square pictures are objectionable, as not giving sufficient scope to good composition, and as all plates used are more or less oblong, it seems somewhat incongruous to make an oblong picture in the camera and cut a square out of it for the lantern. In my opinion, therefore, it is far more desirable that the artistic side be given the preference over time-honored custom, and that we adopt mat openings which best harmonize with the subject of the picture, whether square, oblong, or round. With this end in view, I have, in addition to the usual square form, which is oftentimes very desirable, three other forms—one for horizontal, one for upright, and one for circular pictures, the openings in the former being an exact reduction of the proportions of a 6½ x 8½ plate. To cut these openings I use a set of steel guides, made exactly 3¼ x 4 on the outside, the inside openings being as first described. By placing one of these guides on the mat on a piece of glass, and using a "Robinson trimmer," the opening can be cut out with great ease and accuracy.

A few words about cover glasses. The desire for a very transparent thin glass has caused many to use a French or German make, which, at first sight, seems admirably adapted to the purpose; but unfortunately there is something in its manufacture whereby the alkali exudes and condenses on the surface in peculiar arborescent markings. This incrustation on the under side of the cover is frequently so great as to almost obscure the picture. This may be overcome by varnishing the cover; but, better yet, use a hard English crown glass like Chance's "B. P. C." I have found ordinary negative glass answer perfectly, care being taken to select it thin and light, free from bubbles and scratches. Where old negatives are used for this purpose the side on which the film has been should be marked and put on the outside. Over a year ago I mounted two plates—in the manner of a slide—one of German glass and one of English crown. Both were chemically cleaned before being put together, and in the time elapsed the incrustation on the German glass is very marked, while the other is perfectly clean.

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* Read before the Photographic Society of Philadelphia.

NOTES.

A Photographic State Association will shortly be organized in Michigan.

The Autotype Co., of London, will shortly put on the market a platinum paper.

The North-Western Photographers' Convention will be held in St. Paul, February 20, 21, and 22.

The Toronto Camera Club announces its fourth annual exhibition, to be held at the club-rooms, March 5 to 9 inclusive.

The Providence Camera Club had on exhibition a number of platinotype studies by R. Eickemeyer, Jr. These have been very much admired by the members.

Alfred Stieglitz.—Our readers will be glad to learn that Mr. Alfred Stieglitz, after a very severe illness, is now making rapid strides toward a complete recovery·

F. P. Cembrano, the distinguished photographer, sends us his greetings in the shape of a neat card, upon which is printed a photogravure reproduction of one of his pictures.

A. H. Griffith, Director of the Detroit Museum and Art School, gave an interesting talk on "Photography," at one of the Sunday afternoon lectures held at the art museum.

Rudolph Eickemeyer, Jr., and Alfred Stieglitz have both been elected members of the English "Linked Ring," a select body of photographers, formed to uphold the claims of artistic photography.

The Newark Camera Club have made several important changes in their By-Laws. The initiation fee has been abolished and resident associate members admitted.

"Public Ledger Almanac."—From the publishers of the *Philadelphia Public Ledger* we have received their ever welcome little almanac. It is, as usual, crammed full of useful information.

The Royal Photographic Society's Progress Medal has been awarded to Dr. P. H. Emerson. Dr. Emerson has undoubtedly done very much by his writings and practical examples to advance the art of pictorial photography.

Union Photo-Engraving Co.—On pp. 145 and 168, will be found two pictures. We wish particularly to draw attention to the fine quality of the half-tone work. The flower study is especially good and reflects great credit upon the makers of the cut, the Union Photo-Engraving Co., of San Francisco, Cal.

Death of R. Eickemeyer.—We regret to learn of the death of Mr. R. Eickemeyer, whose portrait appeared in our last issue, taken by his son, R. Eickemeyer, Jr., the talented amateur photographer. Our heartfelt sympathies are extended to the bereaved family.

Indiana Association of Progressive Photographers' Convention will be held in Indianapolis, Ind., commencing March 5th, and lasting until March 8th, inclusive.

Particulars and list of prizes offered can be obtained from the Secretary, E. E. Shores, Vincennes, Ind.

Nepera Platinoid Paper.—We have examined some specimens of work done upon this paper, and consider them excellent in every way. There is a depth of color in the shadows and a delicacy in the high lights and half tones that we have never seen equaled in any bromide paper. They closely resemble platinotypes.

Boston Camera Club.—The Seventh Annual Club Exhibition will be held in the Club-rooms through the month of April, and will be open to the public for a portion of that time.

All exhibits must be sent to the Club-rooms, addressed to the Entertainment Committee, not later than March 15th.

The Seattle Camera Club has been organized with twelve charter members, and the following officers elected: President, Dr. F. A. Churchill; Vice-President, Mr. Orion O. Denny; Secretary, Emil de Neuf; Treasurer, C. W. Parker. The Club will hold monthly meetings, and a large membership is expected before summer.

Another Mystery.—A correspondent to *Photography* writes that he recently tried to develop a plate; nothing appeared for a couple of minutes, so imagining it to be one he had forgotten to expose he placed it in water. On lifting it out he was "surprised and delighted to find that it had developed itself out fully and was ready for the alum bath." Next, please!

E. Stewart Tracy, of Jackson, Tenn., recently opened a new gallery. All ladies and gentlemen over 70 were invited to have their photographs taken free of charge as a souvenir of the event.

Platinotype printers are reminded by Messrs. Wiliis and Clements that, during the cold weather, it is advisable to raise the temperature of the developer at the time of developing. If this be not done, streaks are likely to occur in the prints. The developer may be warmed to a temperature anywhere between 75 degs. to 120 degs. At the highest mentioned temperature it will be noticed that the prints are slightly warmer in tone.

The Mystic Camera Club.—At a meeting of this Club the following officers were elected for the ensuing year: President, J. F. Wade; Vice-President, C. A. Clark; Secretary, W. M. Archibald; Treasurer, J. B. Thaxter, Jr.; Members of Executive Board, E. B. Conant, C. A. Staniford, J. M. Foster. Address all communications to Warren M. Archibald, Secretary, 8 South Street, Medford, Mass.

"The Photogram."—The publishers of this enterprising magazine have done a wise act in issuing a special *edition de luxe*. Many of the fine illustrations were but poorly presented on the cheaper kind of paper which we presume it was necessary to use owing to the low price of the magazine. We feel sure that the majority of the subscribers will prefer to pay the slight extra cost and secure the magazine in so fine a form.

In the January number of *The New Science Review* the "New Element in the Atmosphere," recently discovered and announced by Lord Rayleigh, is made a subject of consideration by the distinguished discoverer, well known as one of the leading scientists of Great Britain. No scientific announcement of recent years has excited so much interest and discussion as this, in view of the fact that the constitution of the atmosphere had been looked upon as fully known.

The Lantern-Slide Competition of *The American Amateur Photographer* has resulted in the following awards:

Class II. Landscapes. Miss E. V. Clarkson and William B. Post, bronze medals.

Class III. Architecture. E. R. Ashton, silver medal, and S. L. Coulthurst, bronze medal.

The judges were Alfred Stieglitz and Walter E. Woodbury.

A Correction.—In our February issue we omitted to state that the paper on "Equations of the Conjugate Foci," by Mr. W. M. Murray, was reprinted from the *Journal of the Society of Amateurs of New York*. This little journal is sent free to all the members of the Society, and keeps them well informed as to the proceedings of the organization, its meetings, exhibitions, etc., together with the various papers and lectures delivered at the numerous gatherings.

Mr. W. P. Buchanan, of the well-known firm of photographic dealers, Buchanan Sons, of Philadelphia, recently gave a lantern-slide entertainment to his employees, patrons and friends.

The collection of views shown was unusually fine, and an able description of them was given by Mr. Buchanan, which was listened to with wrapt attention. One of the features of the entertainment was the introduction of the famous white cat "Grover." Every one present received a silver souvenir, being a picture of this famous cat.

Lantern Slide Contest.—With a desire that the interest and activity in slide-making may be continued, the Lantern Side Committee of the Boston Camera Club, as a prize competition, propose the following:

Four negatives of different qualities have been selected, from which each competitor must submit one slide from each.

Each set thus entered will be submitted to three members, who will be selected to act as judges; and a prize, to be decided upon later, will be given for the best set.

Syracuse Camera Club.—The following have been elected: W. H. Olmsted, President; George Timmins, Vice-President; Herbert F. Smith, Secretary; John D. Pennock, Treasurer. These officers, with the following, constitute the Board of Directors: C. E. Life, Fred Brower, F. E. Schnauber and George Worth. All the above officers are enthusiasts in photography, and have the interests ot the club much at heart, insuring the continued prosperity of the club, and the upholding of the good name the club has attained for activity and good work.

The Picturesque Hudson.—Unless some decided action be taken to prevent the work of quarrymen and others from proceeding, the beautiful features of the historic Hudson River, in which every patriotic American feels such a just pride, will be removed for ever.

Governor Werts, of New Jersey, in his annual message to the Legislature of that State, has called particular attention to this subject, and it is thought probable that the Legislature of New Jersey, as well as the General Assembly of New York, now in session, may take some action in aid of this movement.

The Royal Photographic Society, which became incorporated on the 1st of January in this year, have determined that the Society shall hereafter consist of two classes, Members and Fellows. In future, no members will be admitted to the fellowship until they have given the Council satisfactory proof of the possession by them of suitable qualifications for the title F.R.P.S., which in this way will become a guarantee of distinct ability on the part of its holder in either scientific or artistic photography. The large accession of members to the Society within the past few months has rendered its migration to larger and more convenient premises imperatively necessary, and the Council have this matter now under their consideration.

Mrs. Chas. Fisk, of Wonewoc, Juneau Co., Wis., writes us a sorrowful letter. Two years ago last January her son, Elmer Fisk, started to return home, but never arrived, and no trace of him has ever been heard of since. He was a photographer by trade, and is described as heavy, 5 feet 11 inches in height, weighing about 160 pounds, light complexion and smooth face. It is thought that a notice in this magazine will perhaps meet his eye. If so, he is entreated to return to his sorrowing mother.

Our Seascape Competition.—In this contest, we regret to say that the silver medal has again been withheld, owing to the work sent in not having reached that high standard which we shall insist upon being attained before the winner shall be entitled to the highest award of The Photographic Times. The winners of the bronze medals are Miss E. V. Clarkson and Mr. W. B. Post. Both received the same number of marks. Certificates of merit to Mr. H. K. Noyes, Mr. Walter D. Welford, and Mr. W. H. Dodge. Owing to the illness of one of the judges we only received the markings as we were going to press with this issue. Full particulars of the contest, with reproductions of some of the prize pictures, will be found in our next issue.

Ed. Wuestner, the well-known dry plate-maker, has just opened a large new factory for the manufacture of his specialties, the old premises having proved too small to meet the ever increasing demand for his orthochromatic, non-halation and eagle equatorial plates.

Anyone having had any experience in commercial dry-plate making will understand the thousand and one difficulties that usually arise when working in new premises, but we understand that the first trial of plate making in Wuestner's new factory proved a very great success; over 1,000 dozen plates were coated, which, after drying and examining, proved to be a most beautiful lot of plates, they being of one uniform coat and not a spot or blemish to be found in the entire lot, which goes to show that Wuestner's idea of triple filtering and washing the air is the proper thing for dry-plate drying-rooms. In our next we shall give particulars of the opening ceremony.

New York Camera Club "Smoker."—When the New York Camera Club announces a "smoker," people familiar with the progressive methods of that wide-awake circle of photographers know that an evening of good-fellowship will ensue. Consequently, on the evening of February 2d, when the second smoking concert of the season occurred, the handsome rooms of the Club, at 314 Fifth Avenue, were well filled with members and their friends, who evinced a decided appreciation of the varied programme prepared by the House and Lantern-Slide Committees, under the energetic direction of Mr. William Bunker.

Acting as Master of Ceremonies, Mr. William D. Murphy delivered a brief but reassuring preliminary address, and then introduced the following artists, whose specialties were warmly applauded: Mr. James Baisley, Banjoist; Prof. Glenfield, Ventriloquist; Mr. J. Wendell, Jr., Songs and Imitations; Dr. W. K. Otis, Prestidigitator; Mr. J. G. Lamb, Humorist; Mr. John P. Nicholas, Comedian.

The programme closed with an admirable show of lantern slides, the work of members of the Club, notable among which were the fine "Seascapes," by Mr. J. M. B. Hard; the rich "Waldorf Interiors" and spirited "Spanish Bull Fights," by Mr. R. H. Lawrence; "Japanese Scenes," by Mr. W. B. Post; "Genre Studies," by Dr. J. A. Booth; some wonderful "Lighting Flashes," by Mr. S. W. Bridgham; a delicate "Sea Anemone," by Dr. R. J. Devlin; the "White Grapes," by Mr. W. J. Cassard; and, crowning all, the beautiful "Flowers and Figures," by Mr. W. A. Fraser.

Then came a cosy supper, and midnight was but a recollection when the last staid member left the Club for his home.

Anthion-Schering.—From Messrs. Schering & Glatz we have received particulars of a new hypo eliminator, invented by Dr. Albrecht Schmidt, and introduced by them into this country under the title "Anthion."

The directions for use are as follows:

The Solution.

Five grammes (75 grains) Anthion are dissolved in one litre (one quart) of lukewarm distilled water. The solution keeps for at least one month.

A.—For Gelatine Plates.

a. The plate (13 x 18 cm.) (5 x 7 inches) or film, after fixing, is allowed to drain and then washed for about five minutes in a dish with about 600 c.c. (20 fluid ounces) of water; it is then again allowed to drain.

b. Afterward it is laid in a second dish with 200 c.cm. (7 fluid ounces) of Anthion solution, and again allowed to remain for five minutes, with occasional stirring.

c. The plate is then once more laid in 600 c.cm. (20 fluid ounces) of fresh water, exactly according to direction *a.*

d. The operations *b* and *c* are repeated.

The plate is then *free from fixing soda.* (In order to determine this, proceed as follows:)

Test.

To be certain that all the fixing soda is completely destroyed proceed as follows: Several c.c. (half to one teaspoonful) of the last washing water are poured into a test-tube and three or four drops of silver nitrate solution (1 to 20) added. A white precipitate generally forms. If this gradually acquires a *yellow* tint, fixing soda is still present.

In such a case operations *a* and *b* are to be repeated.

B.—For Positive Paper Prints.

The operations are carried out as under A, but instead of one plate five fixed copies (13 x 18 cm.) (5 x 7 inches) are taken, allowed to drain one by one, then laid singly in water (vide *a*), afterward in Anthion solution (vide *b*), then again in water (vide *c*), again in Anthion solution (vide *d*), and finally in water.

It is important that the paper prints are frequently separated in the different baths. If the prints stick together, the solution does not penetrate and cannot act.

Important.

For large plates and prints it is not only necessary to use larger dishes, but also more liquid, both Anthion solution and water. An excess of Anthion or of water is decidedly useful, but less is disadvantageous.

The above directions for washing relate to those who have no continual flow of water at hand.

If a continual flow of water is obtainable it is advisable to wash the plates or prints in flowing water for a quarter of an hour, and then dip in the Anthion solution and test the result as above.

Orthochromatism in Photography.—Capt. Houdaille gives, in the *Bulletin Société Francaise*, the result of some experiments he has recently made. These are translated in *The Photographic Journal*, as follows: Capt. Houdaille states that the experiments he made were in regard to the sensitiveness of such emulsions to the various reflected colors, rather than to those as given by a prism. Preliminary experiments were made on the orthochromatism of the human eye and the determination of the distance at which points of various colors, such as white, green, yellow and red, 1 mm. in size on a black ground, could be distinguished. In order that the eye can count a group of seven such points, the image on the retina must occupy at least an area of $\frac{1}{40000}$ square mm. In order to see a single isolated point the area in question may be reduced to $\frac{1}{1600000}$ square mm., and lastly a continuous line must produce on the retina an image of a width of $\frac{1}{720}$ mm. in order to be visible.

As a mean of a number of trials, it was found that the white and yellow produce the same impression on the eye, the green is a little more feeble, and the red still more so.

Taking 100 as the aggregate value of the four colors, the sensitiveness of the eye to the colors are as follows:

White	29
Green	22
Yellow	29
Red	20

The objects were then photographed, and the writer deduces the following law, governing the relation between perception, the area of the object, and the quantity of light received by the object.

In order that a point of very small dimensions may be perceptible to the eye, it is necessary that the product of its surface, and the quantity of light acting upon it shall be a constant.

For instance a given light acting for—

1 second .... 1 mm. square = area 1.
4 " .... $\frac{1}{2}$ " " = area $\frac{1}{4}$.
16 " .... $\frac{1}{4}$ " " = area $\frac{1}{16}$.

It will be seen from the above that in all cases the product of the light and the area acted upon are a constant.

Having ascertained and verified this law, the sensitiveness of plates to the various colors can be deduced. An under-exposed plate does not reproduce the yellow or the red, but the work done is principally on the white, and, to a certain extent, on the green.

A plate which has received a normal exposure, that is to say, which gives an image of value of the white and red, exhibits the following color sensitiveness:

White	46	Exposed under a petroleum light.
Green	27	
Yellow	19	
Red	8	

An over-exposed plate gains in the yellow and red, at the expense of the white and green.

The various luminants employed were: the light of petroleum, sunlight, magnesium ribbon and flash-powders. Sunlight and magnesium light were found to be similar in their action.

Flash-powders and petroleum give an increased sensitiveness to the yellow and red at the expense of the white and green.

The use of a colored screen lowers the action of the white and red, and increases that of the green and yellow. It is unnecessary to employ screens of a dark tint.

Those supplied by Clement and Gilmer, with their Telephoto lens, increase the exposures, 2, 5·5, and 12.5 respectively. The orthochromatic effect is the same for all.

Rapid plates are more sensitive to the red than slow plates, and the effect of white light is less powerful.

The orthochromatic plates, series A, made by Lumière sensitive to the yellow and green, gain 4 per cent. in the green, 2 per cent. in yellow, and lose 5 per cent. in the white, and 1 per cent. in the red.

When used with a screen the red loses still and the yellow rises.

The plates series B lose 8 per cent. in the white and gain 5 per cent. in the yellow, and 3 per cent. in the red, the greens remaining stationary. When used with a screen they lose 1 per cent. in the red, and the same is gained by the yellow.

If it is desired to photograph near objects in which the red predominates, plates of the B series are the best, and an over-exposure using flash-powders as a luminant should be given.

If, on the other hand, under similar conditions, the green and yellow are in the ascendant, series A should be used with a screen, a petroleum lamp, and over-exposure. In the case of objects at a distance it is a question rather of accentuation of contrast than of reproduction of color. In such a case slow, ordinary plates can be used with a yellow screen.

In concluding his paper, the writer points out that it is quite possible to exaggerate the importance of orthochromatic emulsions, and he states as a practical result of his investigations that an ordinary plate, used with a screen, gives the same result as a plate series A, sensitive to the yellow and green, when used without a screen.

An ordinary plate which has received four times the normal exposure is about equal to a plate series B normally exposed.

An ordinary plate impressed by the light of a petroleum flame is nearly identical with a plate series A exposed to diffused light.

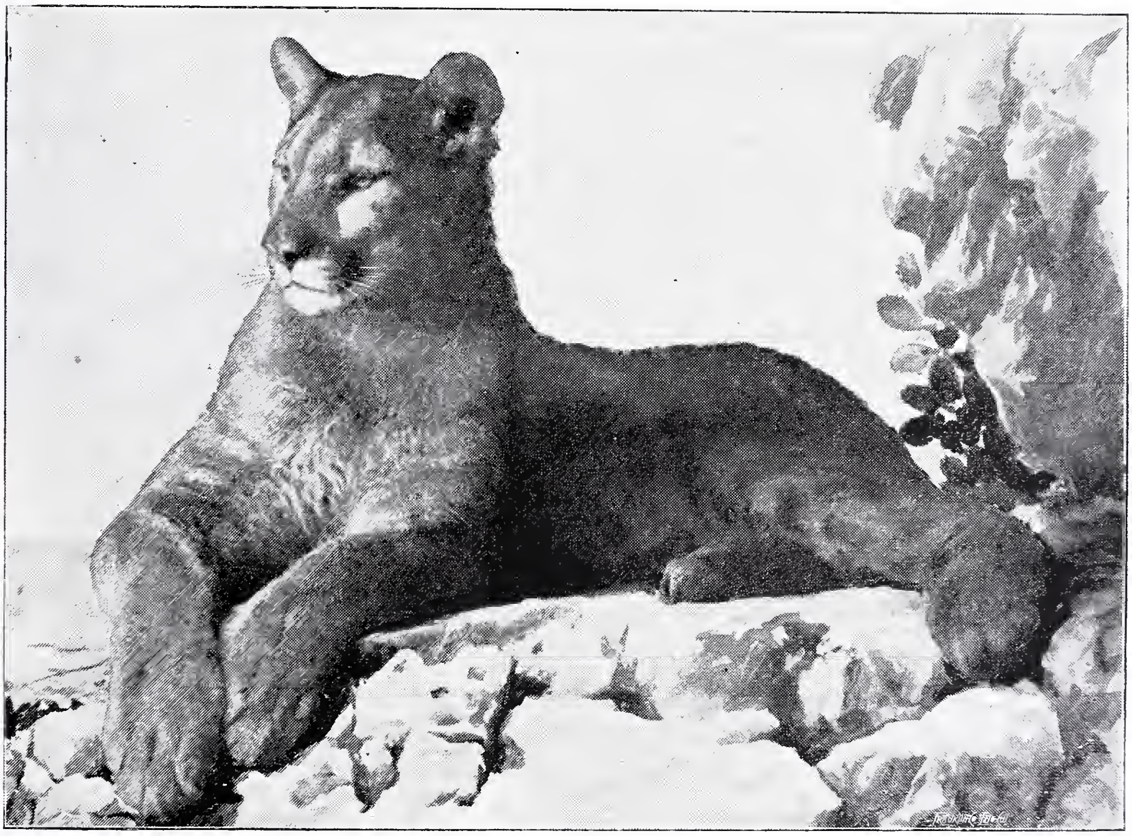
THE EDITORIAL TABLE

Reviews of Books, Photographs, Apparatus, etc. Received

"Hoofs, Claws and Antlers of the Rocky Mountains." By Mr. and Mrs. A. G. Wallihan. Price, $3.50. Edition de Luxe, $5.00. Published by Frank S. Thayer, Denver, Colo.

This is undoubtedly one of the most interesting books we have seen for some time. In it are thirty-seven full page illustrations of all kinds of wild animals taken in their natural haunts. No one can thoroughly realize the amount of patience required. The plan of procedure adopted by the authors appears to have been to lie in ambuscade near some game trail or spring and wait with the camera already fixed up, focused and ready for the exposure, for the timidity of these animals would cause them to disappear like lightning at the slightest sound on the part of the photographer.

The authors undoubtedly deserve great credit for the manner in which they have prepared their work, for never has such an interesting collection of photographs been made. The book should be in the hands of every naturalist or lover of animals.



Copyright. 1894, by Frank S. Thayer.

MEDITATION.

Frontispiece to "Hoof, Claws and Antlers."

"Haunts of Nature." Nathan A. Gibbs, Norwich, Conn.

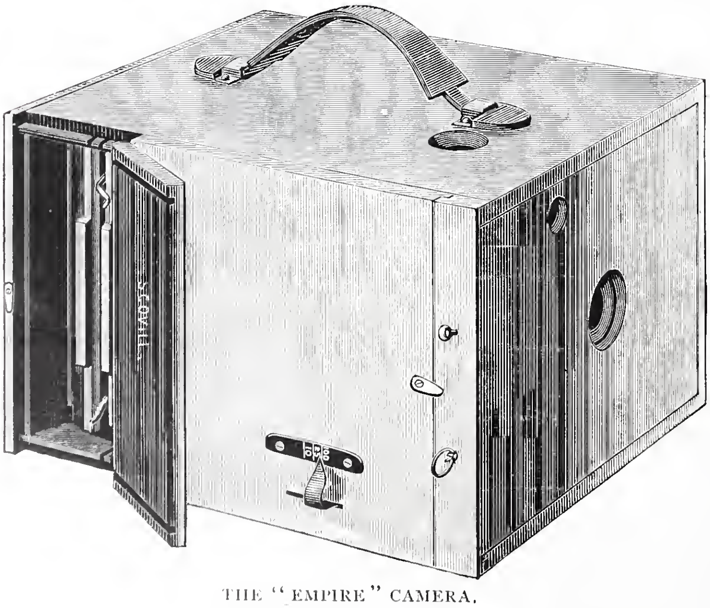
This is an exquisite collection of photogravures from photographs by Mr. Nathan A. Gibbs, illustrating Bryant's "Inscription to the Entrance to a Wood." There are several pictures, all particularly fitting, both in subject and treatment, to the lines which they illustrate. Mr. Gibbs is also the publisher as well as the illustrator of the book.

Sarony's Living Pictures, No. 4. A. E. Chasmar & Co., 34 Union Square, N. Y.

No. 4 of this excellent series of superb reproductions of living pictures, by Sarony, makes its appearance, and is, if possible, better than the preceding issues. By the kind permission of Messrs. A. E. Chasmar & Co., we are able to reproduce on other pages of this magazine some more examples of the pictures. Each issue contains ten such, and the price is but 25 cents. Every photographer should obtain this set of pictures, showing the possibilities of the camera and brush combined in the hands of the renowned artist and photographer, N. Sarony. The publishers state that they will, upon receipt of $3.00, send "Sarony's Living Pictures" for one year (twelve numbers), and an exquisite typogravure of "Cupid on the Watch," the first picture in this number, size 10 x 13, printed on heavy plate paper, 19 x 22. This picture is reproduced from life with wonderful fidelity to nature.

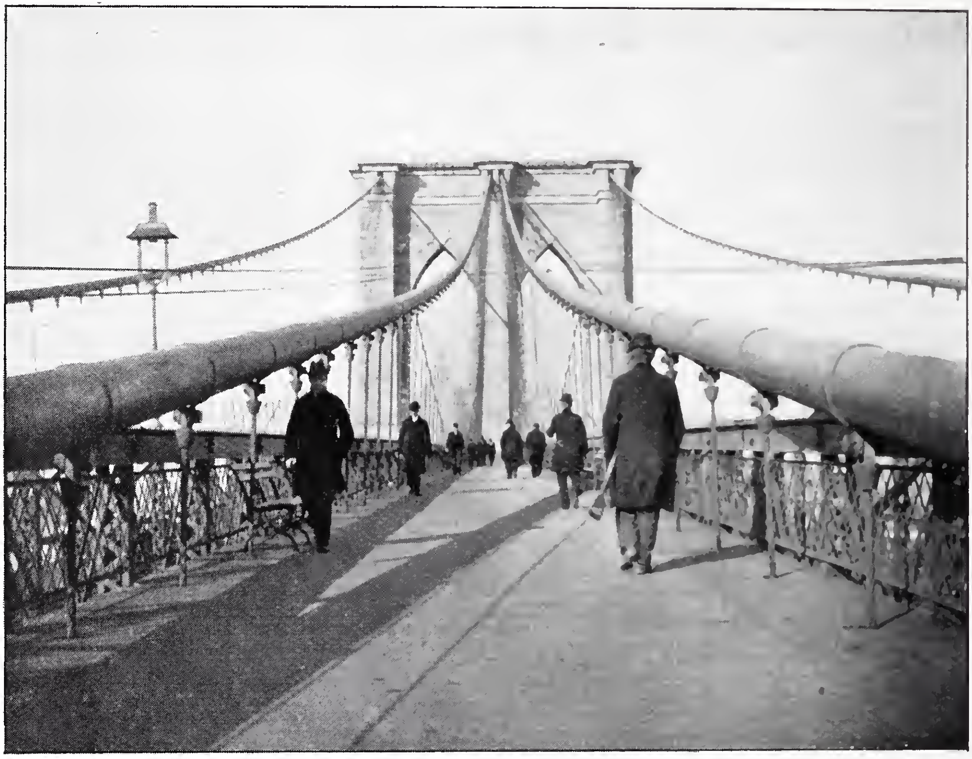
No Enemy (but Himself). New York: Messrs. G. P. Putnam's Sons.

We were attracted at first to this book by a new departure in its illustrations, the same having been made from life by photography. The story itself is cleverly written, and chiefly humorous. The scenes and situations are often extremely funny. A New York wealthy man, having nothing better to do, out of curiosity attempts the life of a tramp. He becomes so fascinated with the happy-go-lucky, free and easy existence, that he continues it for some time, and even returns to it again after settling in his home for a while. The story of how he gets along, shunning all work, is both amusing and interesting, as it gives some insight into the ways and means of the professional tramp. The author has, perhaps, been unfortunate in his winding up of the story, transforming a rich comedy into a dismal tragedy.



THE "EMPIRE" CAMERA.

The book is, however, well worth the reading and is especially interesting to photographers, inasmuch, as the illustrations, as we have said before, were produced from photographs from life. Interesting, as it shows the almost insurmountable difficulties that lie in the way before photography can be employed for such a purpose. No doubt great pains have been taken to secure these pictures, but an artist would have done better in one hundredth part of the time. The characters are not in accordance with the text, the expressions are unreal, and there is in many cases the consciousness of the presence of the camera. The best illustration is that of the old lady.



SPECIMEN OF PHOTOGRAPH TAKEN BY "EMPIRE" CAMERA, SHOWING QUALITY OF THE LENS.

The "Empire" Camera.—We have been accustomed to looking upon low-priced cameras as worthless, except as toys, but with the instrument under review we must certainly make an exception, for, although its price is but $5, finished in antique oak stain, or $7.50, leather covered, it is nevertheless a good practical working instrument, as we can testify from experience. The lens is without doubt equal to those fitted to cameras sold at $15 or more. Some idea can be obtained of its working power, definition and light concentration, from the illustration given herewith, which is a reproduction from a snap shot. The corners are well covered and sharply defined. The appearance of the apparatus can be seen from the accompanying cut. It is well finished, contains a focusing adjustment finder and a time and instantaneous shutter. The instrument has evidently been constructed to meet the present popular demand for a good working instrument at a low price, and it undoubtedly "fills the bill." It is manufactured at the famous works of the American Optical Company, and is sold by all dealers.

An Elementary Chemistry. By George Rantine White, A.M. Boston: Ginn & Co. $1.10.

In this work is given a course of elementary chemistry grown out of the author's experience in teaching. It is based on the modern pedagogical principle of induction, and also on the modern practical method of laboratory experimentation, and will be found of immense value to beginners who study without a teacher.

Photographers desiring to learn something about the chemicals which they are daily handling, cannot do better than purchase such a work as this, and by repeating the experiments given, they will soon learn much that will be of value to them in their daily practice.

"The International Annual" for 1895. Edited by F. J. Harrison. E. & H. T. Anthony & Co., 591 Broadway, New York.

The editor is certainly to be congratulated in having in this volume excelled all its predecessors. The articles are varied and interesting, and there are few of them from which the photographer cannot gain some valuable pointers.

"The Year Book of Photography" for 1895. Edited by T. C. Hepworth, F.C.S. London: Alexander & Shephard. New York: The Scovill & Adams Co., 423 Broome Street,

This ever welcome little annual is as full of bright things as ever. It contains the results of photographic experimenting during the past year and many special articles by the leading photographic authorities. It is well illustrated with reproductions, chiefly from pictures by the talented editor.

"The Metaphysical Magazine."—The first number of this new monthly, a copy of which lies on our exchange table, presents a most attractive appearance. Its contents are varied and unique, and represent a distinguished list of contributors. Prof. Elliott Coues propounds his telekinetic theory of "levitation"; Dr. Alexander Wilder, F.A.S., discusses "The Antecedent Life"; the Countess Norraikow advocates the abolition of capital punishment; W. J. Colville, the famous inspirational orator, discourses upon the ethics of mental healing; and other noted writers state their views on a variety of interesting topics. The new periodical is handsomely printed, well edited, and, having the field almost entirely to itself, is an assured success. It is issued by the Metaphysical Publishing Co., 503 Fifth Avenue, at $2.50 a year.

Chemical Arithmetic and Equation Writing. By J. H. Beal, Sc.D., Ph.G. Price 75 cents. Published by Nitschke Bros., Columbus, Ohio.

There can be little doubt but that this work is destined to fill a void that has long been felt by students and instructors of chemistry, or by photographic students who are endeavoring to master the system upon which modern chemistry is built. Photographers are often confounded by the chemical symbols and formulæ which are usually employed by the best writers to better illustrate the chemical action that takes place in various processes, and a study of this little work will enable him to master the subject. It includes symbols, and formulæ, and what they are for; how to write and interpret them; the use of equations; calculation of molecular weights; gaseous weights and volumes; specific gravity of solids and liquids and its calculation, and much other valuable information.

Salt Lake City and Vicinity. Published by C. R. Savage, 12 Main Street, Salt Lake City, Utah.

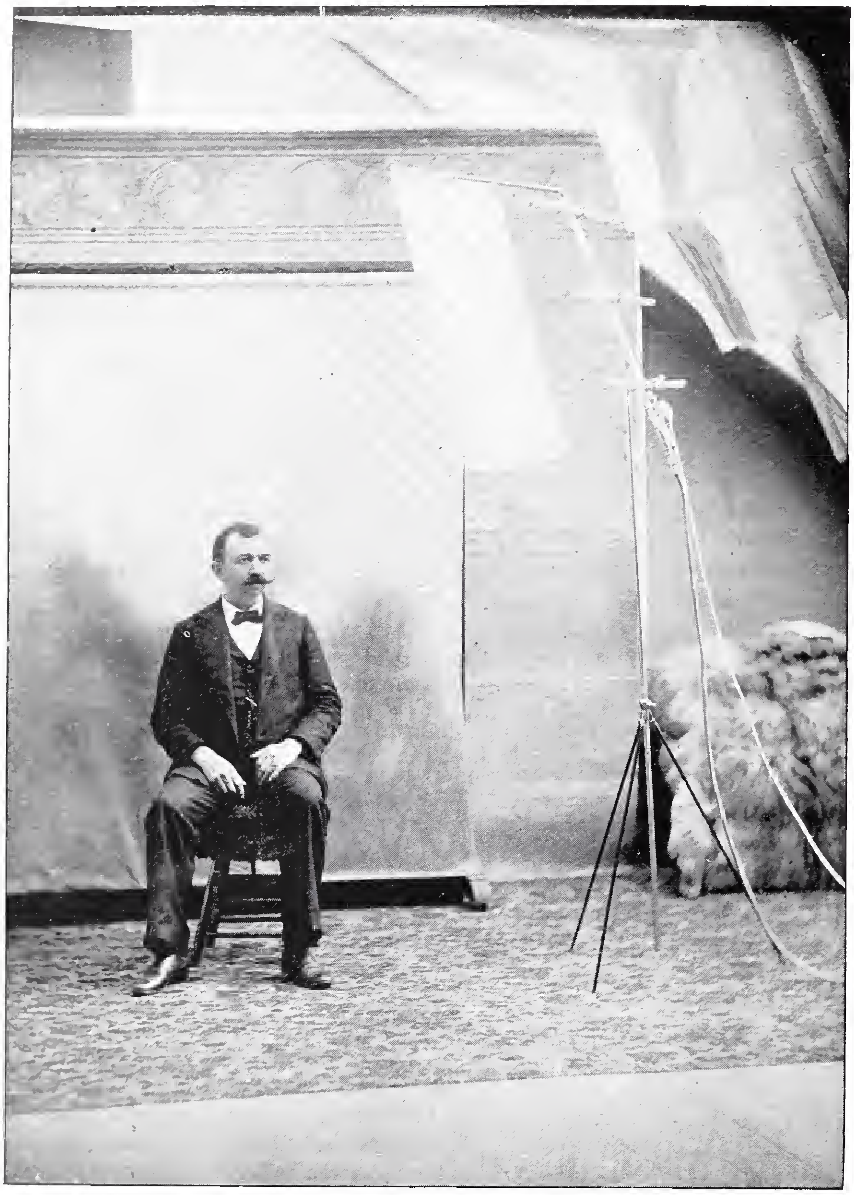
This little work comprises an album of views of Salt Lake City and Vicinity, which speak well for Mr. Savage's abilities as a photographer, together with a letter-press description of the public edifices, hotels, bathing resorts, and quite a variety of information valuable to the tourist. Salt Lake City is undoubtedly one of the most interesting cities of the world, and Mr. Savage's description of the place and its inhabitants will be received with interest.

"Wilson's Photographic Magazine."—Our thanks are due to the publishers for a handsomely bound copy of this interesting magazine. It forms a valuable addition to our library.

The Life and Inventions of Thomas A. Edison. By W. K. L. Dickson and Antonia Dickson. New York and Boston: T. Y. Crowell & Company, 1894. 362 pages, 158 illustrations; boxed, $4.50.

In this handsome volume the authors tell us the story of the life of a man whose achievements are known by every one, and whose name has such a fascination for the general public. The accounts of the lives of great men are often inclined to be heavy and wearisome at times, but in the story before us the authors have such an abundance of material to draw from, all of which is of interest, and moreover the literary abilities and close connection with the great inventor have enabled them to produce a story which captivates our attention from first to last. Mr. W. K. L. Dickson is not by any means unknown to our readers. His portrait, and some account of his life, appears in our '95 "Annual." He is the chief of the mining department, and also of the photokinetograph department, at Edison's Laboratory at Orange. In this position he has been able to gather the material necessary for the story, and his sister, Miss Antonia Dickson, who is famous as a writer, has co-operated with him in the production of a popular life history of Edison, free from confusing technicalities and irrevelant matter. We learn that Edison comes of a long-lived race. His grandfather lived to 103 years of age, and his great-grandfather to 102. He was born at Milan, Erie, Ohio, on February 11, 1847, and is thus 48 years of age. The early wanderings and life struggles of the penniless boy are told in a graphic manner. His life as a telegraph operator is next portrayed, with the accidental change in his whole fortune, which led to his establishing a machine shop of his own, and at last having money in the bank. The various steps which led up to the perfection of the phonograph, microphone, telephone, and many other of his inventions, are all treated upon, together with an interesting account of a search all over the world for a suitable fibre for use as a filament in the incandescent lamp.

The Hunter Flash-Light Machine.—Ever since the introduction of flash-light compounds, attempts have been made to employ them in photographic studios to supply an illumination which should take the place of our solar orb, after that useful functionary had retired to rest. Such attempts were more or less satisfactory—chiefly less. The greatest difficulty that had to be contended with was the apparent impossibility of obtaining an even illumination. The results were invariably so harsh and chalky in appearance as to be useless. The high-lights received too much illumination, and heavy shadows were produced usually without detail.



THE HUNTER FLASH-LIGHT MACHINE READY TO USE.

The necessity for spreading the light became at once evident, and many minds went to work to think out a suitable method. Of the results we have seen we think the best to be the arrangement devised by Messrs. Hunter Bros., who are practical photographers, and have therefore been able to thoroughly understand the requirements of the case. The first apparatus which they devised, and which we reviewed some time ago in the columns of our weekly magazine, was afterward found to be unwieldy, large and cumbersome. The present one is but three feet square, but is provided with a suitable head screen, which has the effect of giving the same distribution of illumination that would be given by a machine 6 feet square. By the use of this screen the light is beautifully softened, and the results that we have seen are equal and in some instances superior to anything made by daylight.

The amount of surface over which the light can be evenly distributed is simply amazing, and the results are shown in the engravings we have made to illustrate the use and possibilities of the machine.

It possesses several advantages over other existing machines which it may be well to point out. The system which has been adopted of igniting the powder is one that will result in the greatest possible illumination with the least quantity of powder. Nothing is wasted. The powder is thrown into the flame by the upward stroke

SCENE IN PRINCE PRO-TEM TAKEN AT THE BOSTON MUSEUM THEATRE BY THE HUNTER FLASH-LIGHT APPARATUS.

of the hammer under the pan. It is thus spread out over a large surface of the flame. Not a grain escapes ignition, and the intensity of the illumination obtained by this means is about twenty times greater than that which would be the result of burning the powder in a mass.

Either gas or alcohol can be used for the flame. If the latter, oniy 2 ounces are required, There are only twelve pans to be filled, a fact that will be well appreciated by the unfortunate photographer who has been accustomed to wasting a large part of his valuable time in filling up forty or fifty pans before the machine could be used.

Another advantage of this apparatus is that it can be taken apart or put together again in a little over a couple of minutes. Each machine is supplied in a neat carrying case and weighs but 9½ pounds. More marvelous of all is the low price at which it is sold, $45. We understand that all the largest dealers in photographic materials will sell them.

Messrs. Newman & Guardia, of 92 Shaftesbury Avenue, London, Eng., have issued a supplement to their catalogue. It contains particulars of some of their latest novelties in shutters, enlarging and reducing cameras, lenses, hand-cameras, etc.

Lens Work for Amateurs. By Henry Orford. New York: Macmillan & Co., 66 Fifth Avenue. 80 cents.

This admirable little work forms a valuable companion to "The Optics of Photography," by J. Traill Taylor, published by the same firm and uniform with this book. The author is well known not only as an able writer upon optical instruments, but as a practical man, thoroughly acquainted with lens making. While we hardly like to recommend the amateur or the professional to attempt to make his own lenses, yet a knowledge of their manufacture can but be of the greatest use to him. A careful perusal of this little book will teach him much; it contains besides some valuable hints on the testing of lenses, both for the photographic camera and for the microscope.

Les Lumieres Artificielles en Photographie. By H. Fourtier. Paris: Gauthier, Villars et Fils, 55 Quai des Grands Augustins. 4 fr.—50 cents.

This little work will be found to deal very thoroughly with the subject of artificial light in portraiture and for various other photographic purposes. Both the theoretical and practical side of the subject are dealt with and a number of different apparatuses described..

Formulaire Classeur du Photo Club. Edited by MM. Fourtier, Bourgeois and Bucquet. Paris: Gauthier, Villars et Fils, 55 Quai des Grands Augustins. Part I. 4 fr.; Part II. 3 fr.—50 cents.

A collection of formulæ made for the Photo Club, and which were printed on cards and issued as supplements to the magazine. In the present form we have them properly classified and neatly bound.

The Collodion Mat-surface Paper.—From the manufacturers of the renowned Ilo paper we have received a sample of their new mat-surface paper, and can confidently recommend it to those aiming at artistic effects. There can be little doubt that for many kind of pictures the mat-surface is far better than the glossy brilliancy which is often so much admired by those whose artistic tastes have not been cultivated. From the directions we find that the treatment of the mat paper is in almost every respect the same as with the ordinary kind. It must, however, be drawn through a cold roller burnisher instead of a hot bar apparatus.

Annual Report of the Bureau of Ethnology, Smithsonian Institute, by J. W. Powell, Director. Judging from the voluminous nature of this report this department of the Institute has not been idle. Some of the accounts of the curious tribes of mankind, of which but little, if anything, is generally known, are remarkably interesting. Photography, of course, plays an important part in supplying pictorial evidence. The work is splendidly gotten up, and illustrated throughout with drawings, photographic reproductions and colored plates.

"The Canadian Photographic Journal."—We regret to learn that a disastrous fire has destroyed the issue of this journal for December. The January number has, however, just been issued, and is much improved in form and appearance.

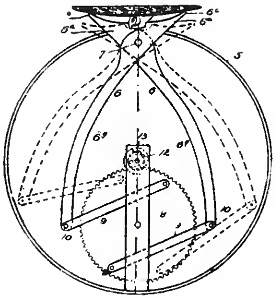
"The Practical Photographer" for December is a specially attractive number, and contains quite a number of good things.

Photography and Book-hunters.—The *Bazaar* tells a story of a well-known book-hunter, who made, as he thought, an important purchase for one shilling, at a stall in Farringdon street—nothing less than a book in quaint style reading on the title: "Much adoe about Nothing, As it hath been sundrie times publikely acted by the right honorable, the Lord Chamberlaine his servants. Written by William Shakespeare. London. Printed by V S. for Andrew Wise and William Apsley, 1600. Needless to say, the book-man secured this *instanter*, for of all the lucky finds since the days of Mr. Halliwell-Phillips until now this was, perhaps, the most noticeable. An indifferent copy sold by auction three years ago for £130, and this one, being in altogether unprecedentedly good condition, was probably worth two or three times as much, and as easy to sell as any book could be. So the book-man, having gloated his fill, trotted off to Puttick and Simpson's to ask that firm to sell it by auction for him as soon as possible, and to graciously advance a small installment—say £50—on account. But, unfortunately, he was there informed that Staunton's photographic reprint of "Much Adoe," although it be from the matchless original of 1600 in the Library of the Earl of Ellesmere, is not worth fifty pence, and so Farringdon Street saved, as usual, its reputation for common sense and discretion.

PHOTOGRAPHIC PATENTS.

No. 532,135. Lens Measuring Instruments. Robert H. Biegel, Denver, Col.

This invention relates to an instrument for measuring the curvature of lenses.



The illustration will serve to give a better description of the instrument than the patent wording.

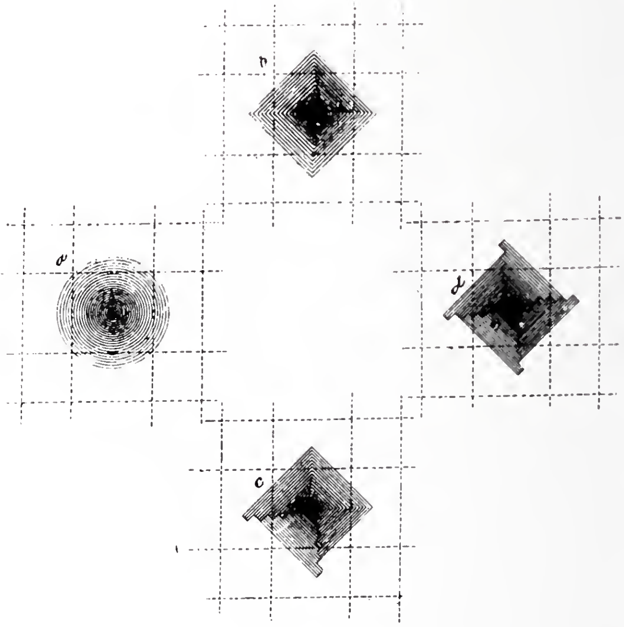
No. 532,173. Process of Printing Photographs on Textile Fabrics. Ralph Martin, St. Paul, Minn.

An invention relating to improvements in photography, its object being to secure a process for photographing upon porous or absorbent surfaces or fabrics in such a manner that the photograph or print constitutes an indelible dye penetrating the body of the fabric so that if the latter be thin the image will be practically the same on both sides. The fabric is first soaked for ten or fifteen minutes in a solution of gum arabic, 4 grammes; salt, 1 gramme, dissolved in 123 c.c. of distilled water. It is then dried and floated on a sensitizing bath composed of 10 grammes of nitrate of silver dissolved in 80 c.c. of distilled water. It is then dried and printed in the same manner as a piece of albumen paper, but with a relatively long exposure, so that the image is as plainly visible on the back as on the front. It is then toned and fixed in the usual manner.

No. 532,326. Diaphragm for Camera. Max Levy, Philadelphia, Pa.

This invention relates to a diaphragm for the photographic lens to be used with a grating or line screen in making half-tone negatives for photo-engraving. The following is the general claim:

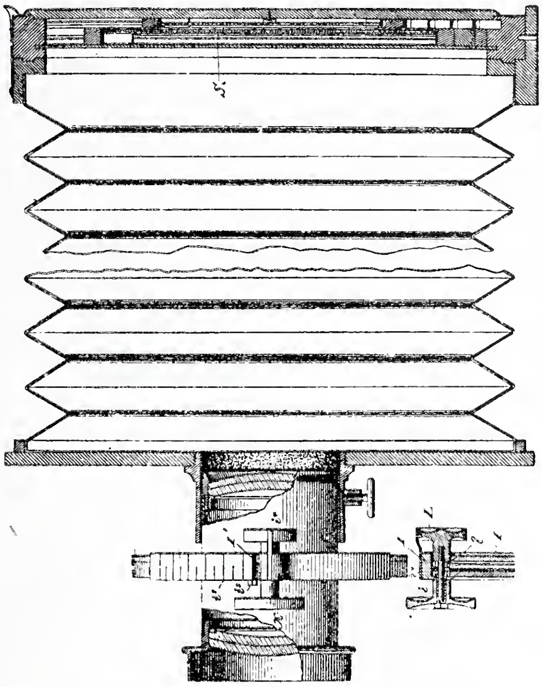
In a photographic lens-tube, a plurality of similar shaped slides with apertures having extended corners and means for moving said slides in unison, of a pair of slides having rectangular apertures and means for moving them one upon the other, the adjusting means being so constructed that the size of the aperture formed by the diaphragm may be changed without changing the configuration thereof, and that the configuration of the aperture may be changed without varying the size of the aperture except at the corners thereof.



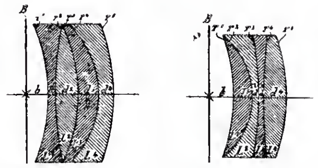
No. 532,327. Diaphragm for Photographic Lens Tubes. Philadelphia.

In this patent the principal claims are for a lens-tube for cameras having annular plates with recesses a^3 and pins a^2, the outer edge of one of the plates being provided with teeth a', and the other plate being cut away on a line with said teeth, disks B and F for operating slides which engage therewith, and with the pins a^2, one of the disks having an apertured projection and the other a projection with teeth formed thereon, in combination with a plate I, having thumb-nuts K and L, one of the thumb-nuts having a spindle which passes through the projecting portion on one of the disks, and pinions carried by the thumb-nuts and adapted to engage with the rack-teeth on the disk, substantially as shown, whereby the slides can be adjusted to increase and diminish the size of the apertures therein or change the configuration of the same.

In combination with a lens-tube for photographic cameras, a suitably supported thumb-nut carrying a pinion, a ring having rack-teeth with which the pinion engages, arms pivoted to the ring, said arms engaging with studs or fixed pins, substantially as shown, so that the arms can be positioned over the centre of the aperture in the lens-tube, for the purpose set forth.



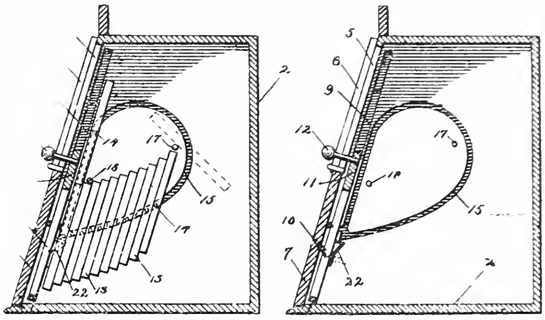
No. 532,398. Photographic Objective. Paul Rudolph, Jena, Germany, assignor to the firm of Carl Zeiss, same place. Filed Oct. 23, 1894. Serial No. 526,692. (No model.)



Claim.—A quadruple lens for single and double photographic objectives, consisting of two couples of lenses cemented together, each of which couples consist of a collecting and a dispersing lens, the dispersing lens of one couple having a higher, the dispersing lens of the other couple having a lower, refractive pow er than the collecting lens coupled therewith, substantially as described with reference to the drawings.

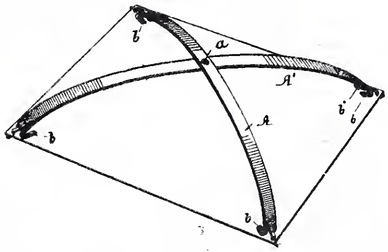
No. 532,571. Photograph Holder. Erick Lund and John Kullberg, Minneapolis, Minn.

Claim.—The combination, in a photograph holder, of the box or casing, provided with the openings in its front, with the series of photograph holders or frames, guides therefor in the sides of said box, the lower parts of said guides being inclined downwardly and toward the front of the box or casing and a frame lifter guided in the front of the casing, and means for operating said lifter from the outside of the casing whereby the frames may be lifted one by one and moved into the back of the casing, substantially as described.



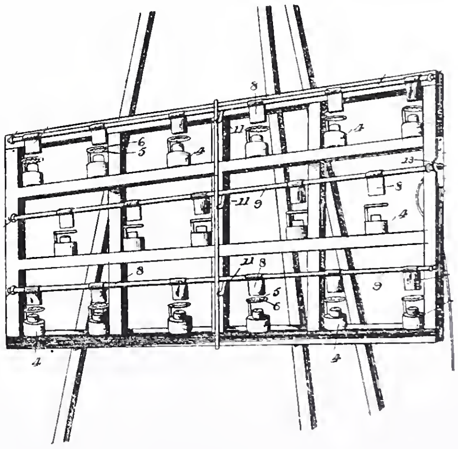
No. 532,751. Film Holder. N. C. Bartlett and Ed. E. Edgerton, Chicago, Ill

This invention has for its object, first, to provide a simple, cheap, and effective means whereby photo negative films can be held in extended condition during the developing operation and while being dried; and, second, to provide a simple and effective means whereby a glass negative plate can be conveniently manipulated while being developed.



No. 532,639. Photographic Flash Light. Charles Clifford and Fred. Clifford, Muscatine, Iowa.

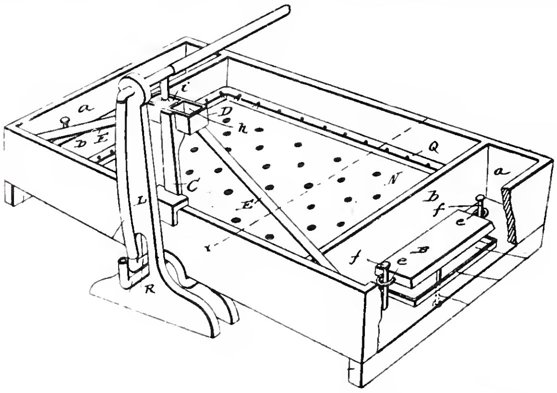
The object of this invention is to construct a flash light apparatus with simple and efficient means for insuring a perfect combustion of the powder and an instantaneous flash of intense light. A rectangular frame of any desired size is provided with a series of parallel



horizontal bars on which are placed a number of lamps arranged in rows alternating with each other so that the greatest possible light may be obtained. Arranged over each lamp is a perforated combustion pan fitted into a circular frame and supported by brackets. These pans receive the direct heat from the lamps when in use, and above each is fitted a movable metal charging plate adapted to support the flash light powder and deliver the same into the heated perforated pans, causing the same to be ignited.

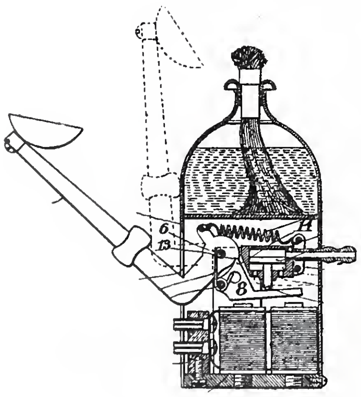
No. 532,775. Photographic Print Washer.

This invention has relation to that class of photographic print washing apparatus in which a rocking tray is employed, and it has for its prime object to improve such devices by rendering them more effective in operation, to improve the tray by providing wells or receptacles independent of the print chamber to receive water which serves to render the rocking of the tray automatic; to more effectively wash the prints by subjecting them to a spray of fresh water above and below, and keep fresh water circulating all around the print; to provide automatic wells to discharge the contents.



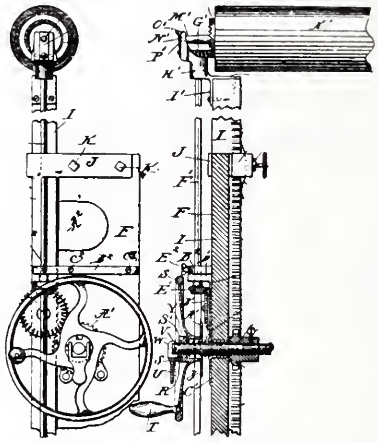
No. 532,797. Flash-Light Device. Thomas H. Macdonald, Bridgeport, Conn.

Claim.—The combination of the casing having formed integral with its upper end an alcohol lamp, the base secured within the lower portion of said casing, and having brackets rising therefrom, the electro-magnets supported on said base, the arm pivoted between such brackets, and having in its heel end a notch, the spring connected to said arm whereby the latter is normally thrown forward, the dog pivoted between said brackets and having its tail extended within the field of said magnets, and provided with a nose capable of engaging with said notch, the spring connected to said dog whereby the tail of the latter is normally elevated, and insulated contact pins electrically connected with said magnets, whereby when the latter are vitalized the tail of the dog will be attracted, thereby releasing the arm and causing the latter to be thrown forward, substantially as set forth



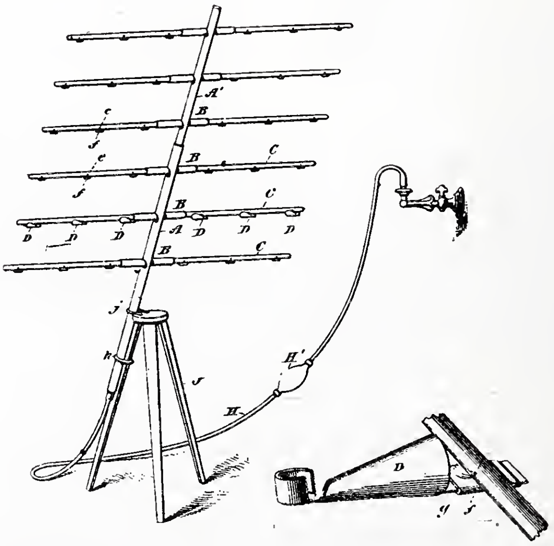
No. 532,844. Background Support. William Trueman, Brooklyn, N. Y., assigned to E. & H. T. Anthony & Co., New York.

Claim.—The combination of a lower frame, a vertically movable upper frame, a roller for backgrounds, supported on the movable frame, mechanism for vertically adjusting the movable frame, and devices for disconnecting said mechanism from the movable frame and connecting it with said roller, whereby it may be revolved in both directions, for the purposes set forth.



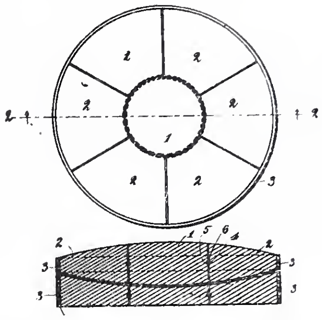
No. 531,915. Flash-Light Burner. Harry C. Fairchild, Sandy Hook, Conn.

The claim made in this is for the combination of a gas-conducting upright closed at its upper end, detachably joined to a support, said gas-conducting upright consisting of an upper and a lower portion detachably connected with each other, hollow branch arms fixedly



attached to and connecting with said gas-conducting upright upon both its portions at right angles thereto, hollow cone supporting arms removably inserted in said branch arms, closed at their outermost ends, corresponding in number to said branch arms and having flame apertures and sleeves in proximity to each other, charge cones having charge receptacles and having extensions whereby said charge cones may be removably attached to the sleeves on the cone-supporting arms, and a gas connection consisting of a tube and pressure bulb whereby the flames from said flame apertures may be simultaneously brought when desired into contact with the charge receptacles of the charge cones, all substantially as herein described and set forth.

No. 531,994. Lens. Louis Gathmann, Chicago, Ill.
In this claim is made for a lens consisting of a central member or section having a peripheral groove, a plurality of sections secured around the central one and in the same plane, the adjacent faces being of the same contour as the central section aligned with the groove of said central member or section and a key in said grooves, substantially as described.



* * *

Photograph by Geo. E. Mariner.

IN THE ONION FIELD.

OUR QUARTERLY COMPETITION.

No. 5.—GENRE STUDIES.

For the best genre photographs we offer the following:

First Prize: A Silver Medal and PHOTOGRAPHIC TIMES Certificate of Merit.

Second Prize: A Bronze Medal and PHOTOGRAPHIC TIMES Certificate of Merit.

Third Prize: A Bronze Medal and PHOTOGRAPHIC TIMES Certificate of Merit.

PHOTOGRAPHIC TIMES Certificates will also be awarded to three other competitors, to be decided by the judges, if the work be sufficiently meritorious.

RULES.

RULE 1.—All entries must be forwarded to Editor PHOTOGRAPHIC TIMES, 423 Broome Street, New York, and marked "Competition."

RULE 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and the coupon to be found upon one of the advertisement pages should be cut out and filled in with name and address, together with a few particulars regarding the photograph and any other details of interest, and inserted in a sealed envelope, upon the outside of which the *nom de plume* must be clearly repeated.

RULE 3.—The competition to be an open one. Any number of pictures may be sent, but each one must be accompanied by a coupon and a different *nom de plume* used in each case.

RULE 4.—All pictures for competition must be sent prepaid.

RULE 5.—The whole of the work entered must be the work of the competitor—that is to say, the exposure, development, printing, toning, mounting and finishing.

RULE 6.—The prints must be mounted. Framing optional.

NOTES.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious The possession of a PHOTOGRAPHIC TIMES Medal will, therefore, be a guarantee of a high order of merit.

The editor reserves the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competion will not be returnable.

The last day for receiving entries will be March 31. The awards will be announced as soon after as possible.

SPECIAL LANTERN-SLIDE COMPETITION.

For the best set of six lantern slides we offer one silver and one bronze medal in each of the following classes:

I. Landscapes.
II. Marine pictures.
III. Genre studies.
IV. Scientific subjects.
V. Architecture.
VI. Portraiture.

RULES.

RULE 1.—Entries may be made in any or all of the different classes, and must consist of six slides for each set entered, sent prepaid.

RULE 2.—Both the original negatives and the slides must be the entire work of the competitor.

RULE 3.—No competitor will receive more than one prize in any single class.

RULE 4.—The coupon to be found in the advertising pages must be filled up and sent with the slides.

RULE 5.—The size of the slides should be 3¼ x 4, or 3¼ x 3¼. When viewing the picture in its natural position the label containing the title must be to the right, and the thumb label on the lower left hand corner.

RULE 6.—Sets receiving the awards will become the property of THE PHOTOGRAPHIC TIMES, and will be loaned to the principal photographic societies. The remainder will be returned at the expense of the competitors, *if so desired in writing*.

This competition will be closed on the 30th day of June, 1895.

PICTURE COMPETITION.

With each issue we intend publishing three or four full-page reproductions.

We shall be pleased to receive pictures for this purpose, and for each one used we will send THE PHOTOGRAPHIC TIMES free, for six months, to any part of the world.

For pictures that are found only suitable for smaller reproductions, we will send the magazine for three months.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY
WALTER E. WOODBURY.

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" six months	2 00
Three months' trial	1 00

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Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries." etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
W. I. LINCOLN ADAMS, MANAGER,
423 Broome Street, New York.
LONDON: JONATHAN FALLOWFIELD,
145 Charing Cross Road, W.

ITEMS OF INTEREST.

Merck's Pyro is standard. Are you using it? If not, you had better adopt it at once. *The leaders* are all using it.

The Hunter Flash-light Machine, fully described in this issue of THE PHOTOGRAPHIC TIMES, is well worth the attention of photographers. The complete descriptive manual will be sent to any one on application to The Scovill & Adams Co.

A well-known amateur photographer who will not admit that he is "a camera crank," writes in regard to the Henry Clay camera that, "Although it is several years old, it is good as new to-day, and I do not know that I ever had a failure with it."

The Empire Camera continues to grow in popularity. It is fully described in this issue of THE PHOTOGRAPHIC TIMES, with a picture made by it. We think the result justifies the assertion of the manufacturers that the lens contained in this camera is as good as that used in most of the $15 cameras.

The announcement is made by Messrs. Ross & Co., of London, that they have completed arrangements with Mr. G. Gennert, of New York, by which Mr. Gennert will assume entire control of their American business. He will keep a complete line of the celebrated Ross lenses; also the Ross-Zeiss lenses, made under a license from Carl Zeiss, and the newly invented Goerz double anastigmats.

C. P. Goerz, the celebrated optician, has opened a branch office in New York at 52 Union Square, East, and will now be prepared to supply his lenses to the American users without delay, through the New York office. The Goez advertisement may be found in another part of this number of the magazine, which contains a description of one or two representative lenses made by this well-known optician.

Did You Attend the opening of Wuestner's new Eagle Dry Plate Works? The Eagle plate is right "*in it*" now!

Good!—"I would not be without the Annual for one hundred times the cost," writes an enthusiastic reader of THE PHOTOGRAPHIC TIMES Annual for 1895.

Let me compliment you upon the fine appearance which THE TIMES now presents. The change is a great improvement, and THE TIMES is deserving of the support of every true lover of the photographic art.—E. L. BOWLUS.

"Your Adjustable Screen Holder (The Scovill) is the best appliance for the purpose I have ever used. We have three of them in the shop at Philadelphia." J. OWEN, Merchantville, N. J.

The Scovill & Adams Co., of New York, publishers of the "American Annual of Photography and Photographic Times Almanac" for 1895, have, in this, the ninth edition, given to the photographic world the most complete and exhaustive treatise on the subject of photography that has probably ever been published. It is not only filled with the rarest thoughts, but is, from an artistic view, a rare work of art, and one that gives the most valuable tables of instruction to not only amateur photographers, but to the professionals as well.—*The Inventive Age.*

Drawing Types in Pictures.—Portraying the character of each person in a story is the most difficult task of all for the artist, writes Frank O. Small, in a very interesting paper telling exactly "How I Make a Drawing," in the January *Ladies' Home Journal.* Society women are of one type, domestically-inclined people of another; the professional and business man has each his distinguishing characteristic, and so on; and of each type one must make a living person and an individual.

The Modern Practice of Retouching.—This little hand-book on retouching has reached its ninth edition, which is to say, that it has proved to be an accepted and standard work on the subject. The fact that it has been and is in use by nearly all those who are conversant with the practice makes it needless to offer any further recommendations to those who have not yet tried the untried. Price, 50 cts., paper. New York: Scovill & Adams Co. —*The Photographic Review.*

The holiday issue of THE PHOTOGRAPHIC TIMES is one of the most beautiful photographic publications that has ever been issued. The opening article on the "Portraiture of the Moon," by the editor, is remarkably well illustrated, as well as graphically wrttten. The following article, on "Two Artists' Haunts," is illustrated by that most talented of talented amateurs in photography, Alfred Stieglitz. The number is crowded with interesting matter, including illustrations showing the results of THE PHOTOGRAPHIC TIMES' portrait competition. Such a photographic publication as this must be a great aid to all students of photography.—*The Brooklyn Times.*

Business Notices.

PHOTOGRAPHERS having first-class celebrity photos for sale will please send sample and price to
W. P. BUCHANAN, 1226 Arch St., Philadelphia.

FOR PLATINUM EFFECTS, use the NEPERA PLATINOÏD-BROMIDE paper. Same price and manipulation as the Nepera Bromide Paper. For sale by
THE SCOVILL & ADAMS CO.

WANTED—Copy of THE PHOTOGRAPHIC TIMES for July 20, 1894. Editor THE PHOTOGRAPHIC TIMES, 423 Broome Street, New York.

"**I must say** that when you announced the fact that THE TIMES would be issued monthly I was disappointed and intended to discontinue my subscription, but when I saw the January number I came to the conclusion that I needed it more than ever."—S. HEBMENAY.

PORTRAIT ENLARGEMENTS FOR THE TRADE.—Photographers can save money by dealing with us.
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56, 58 and 60 Market St., Potsdam, N. Y.

P. C. DUCHOCHOIS,
PHOTOGRAPHIC CHEMIST,
154 W. 16TH STREET, NEW YORK CITY.
Consultation on the processes of pure Photography, and on their applications to the Industry.

The '95 "Times Annual" is going to be top of the heap as usual, I imagine, and it can't be competition that gets it there, for competition is not to be mentioned in this connection.—O. JARECKI.

WANTED.—Bound or unbound copies of vols. 7, 8, and 12 of THE PHOTOGRAPHIC TIMES. Please address, giving price, the Editor of this magazine.

WANTED.—Copies of THE PHOTOGRAPHIC TIMES for January 5th. Apply Editor, THE PHOTOGRAPHIC TIMES, 423 Broome Street, New York.

FOR SALE CHEAP—A 5x7 Excelsior Camera, with tripod complete. Address, J. E. C., P.-O. box 781, New York City.

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Price-list, including 25 sheets of Collins' best quality White Cards:

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SEE RIGHT HERE.—I will sell an *edition de luxe* copy of the 1894 Annual for $3; quite new; published price $5; gilt edge, morocco binding. First person sending $3 has it. W. E. W., THE PHOTOGRAPHIC TIMES, 423 Broome Street, New York.

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To the Editor of THE PHOTOGRAPHIC TIMES:

I am very much pleased with the Henry Clay Jr. camera which you sent me. It is a little beauty. Has been much admired by my friends, and it has a good lens which is the main thing. * * * I thank you sincerely for your selection of camera, its moderate price, etc.

Yours truly,
JULIAN CENDOYA.
SANTIAGO DE CUBA, W. I., Dec. 6, 1894.

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New Construction
Don't Leak Light.
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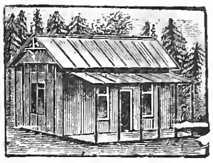

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By assistant operator and retoucher; out of town no objection. L. C. Westervelt, 75 West 12th Street, New York City.

A young man of good habits and references desires situation in some first-class studio as printer or retoucher, and can help out in operating room; experience six years and perfect satisfaction guaranteed. Box 21, PHOTOGRAPHIC TIMES.

By a young man of good address and well up in the photographic business, a position in stock house or on the road; good reference. Address M., Box 385, Poughkeepsie, N. Y.

Lady of experience desires position as "mounter and spotter"; also understands "reception room" duties; references. "Photo," 53 Orange Street, Brooklyn, N. Y.

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SOME ONE HAS SAID of Santa Barbara, "Beautiful Santa Barbara, how shall I describe it?"—that is the feeling one has when they see some of L. W. Seavey's latest efforts in Joshua Reynolds. Van Dyke backgrounds and tapestry effects—they are indescribable, rich beyond description. No photographer who has an ambition to keep up with the times should miss an opportunity of seeing them. These samples will start a new train of thought, will act as an artistic tonic. You should see them whether you are quite ready to buy or not; having seen them, it is not necessary for you to order direct from the sample, you can have something in the same school.

James L. Breeze, in "The Relation of Photography to Art," in the December *Cosmopolitan*, says, and says truly, "wherein photography presents facts, it is a science; wherein it presents ideas, it is an art" Let Seavey help you to work out some new ideas. "He is a very prince of background painters," in that he not only originates but that he can reproduce and give the customer a ground *precisely like the sample shown*, copy a design selected slavishly, or if his fancy is given play he will give you an adaptation of the subject which has pleased you that will be a new creation worthy of yourself and worthy of Seavey He invites customers to offer new suggestions and takes great personal interest in carrying out their wishes. It is not necessary that a list of the best customers of the country be given to attest the facts as above stated. Let him have an order for one special ground and your name will be found among those he is pleased to refer to.

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No. 4.	Tele-photo Objective, No 2. No. 5158), Dallmeyer aluminium shutter	123 00
No. 5.	Gray's Antiplanat Steinheil, Series 2. No. 6. No. 29859, instantaneous shutter,	95 00
No. 6.	Dallmeyer Landscape Objective, single lens, No. 6. No. 46849	115 00
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No. 10.	Scotch Detective Camera, pretty well worn	12 00
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10 x 12	"	1 40,	" 1 45
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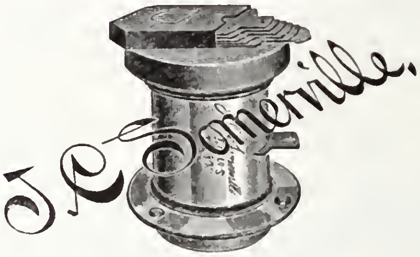

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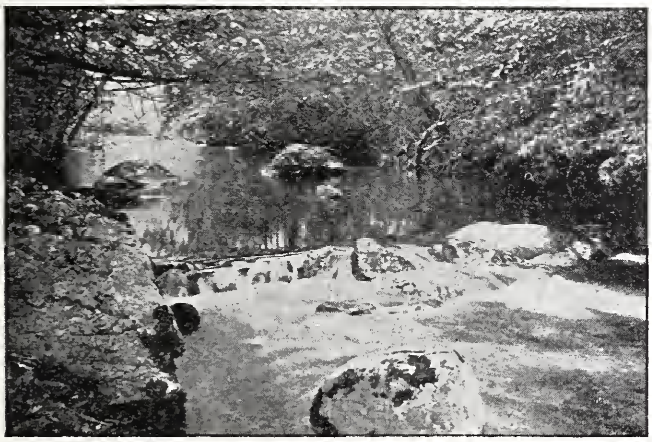

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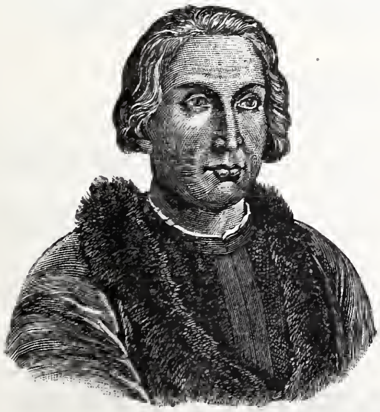

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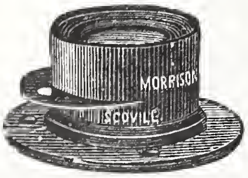

These lenses are absolutely rectilinear; they embrace an angle of 90 degrees, and are the most rapid *wide-angle* lenses made.

No. of Lens.	Diameter	Size of Plate.	Equivalent Focus.		Price.	
0	..1 inch	...3¼x4¼ inch	... 2½ inch	...each,	$20.00	
2	..1 "	...4 x 5 "	... 3½ "	... "	25.00	These 5 sizes will fit into 1 flange.
3	..1 "	...4¼x 6½ "	... 4½ "	... "	25.00	
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5	..1 "	...6½x 8½ "	. . 6½ "	... "	25.00	
6	..1 "	...8 x10 "	... 8 "	... "	30.00	
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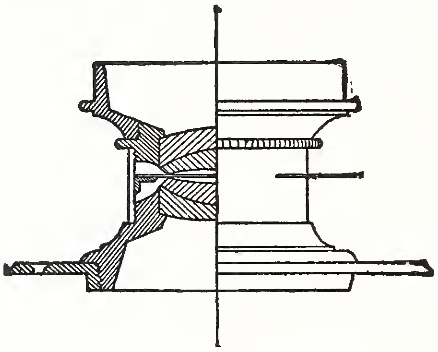

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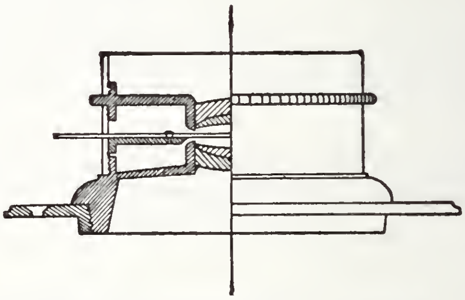

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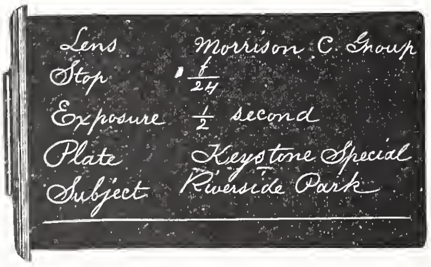
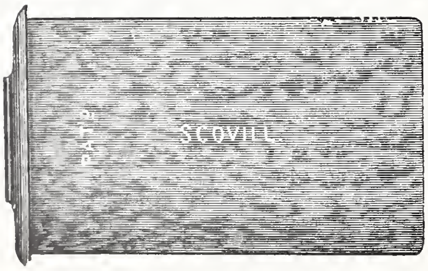


Lens Morrison C. Group
Stop $\frac{f}{24}$
Exposure ½ second
Plate Keystone Special
Subject Riverside Park



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In the pleasure or excitement attendant upon picture-taking, holders slides have been so changed about that the note-book afforded no clue to their identity. All photographers, whether professional or amateur, who have in time past puzzled their brains in the endeavor to solve such vexatious questions as these—

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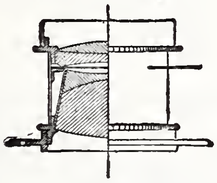

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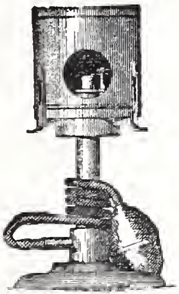

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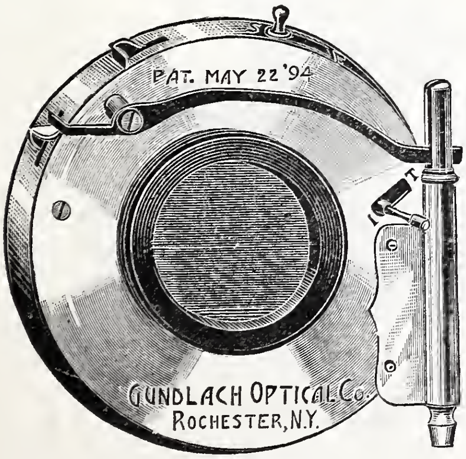

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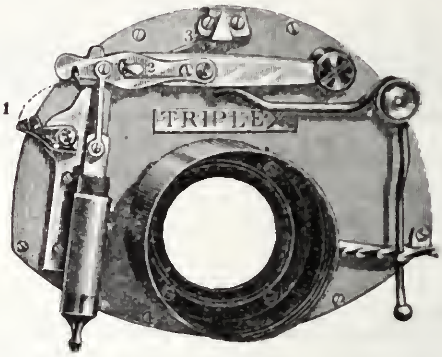

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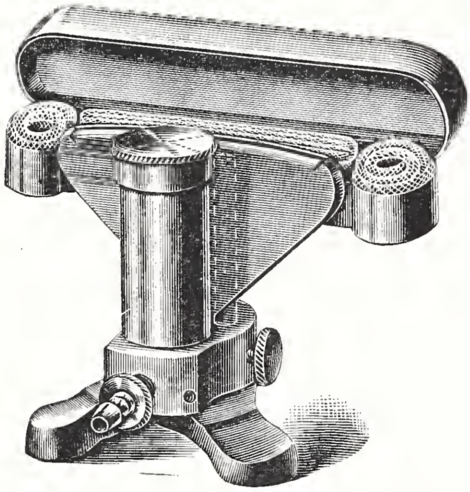

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IT GIVES SATISFACTION.

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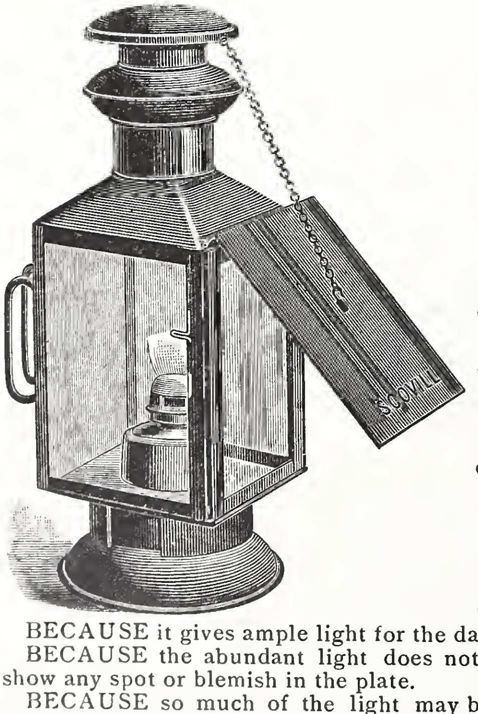

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40 Cents per Bottle.

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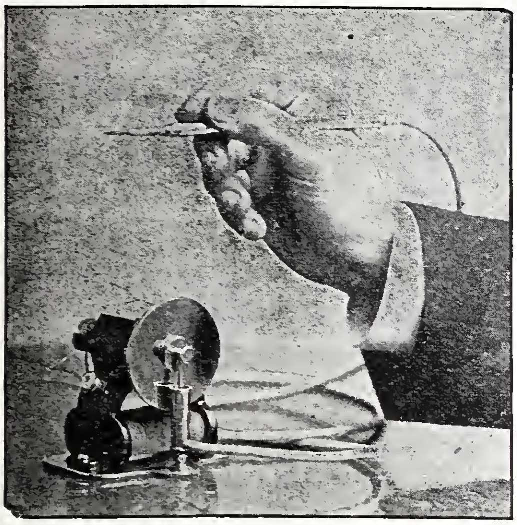

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In the third place, a retoucher can sit down and do in one hour with the machine what would require three hours work by hand.

Another thing. While we do not claim that a novice can sit down and do as perfect work with it in the start, we do say that with a little practice he can do the work of the average gallery, and do it well.

The outfit, complete, consists of a battery enclosed in a neat wood case, a motor with pump attached, as shown in the cut, a metal lead holder, which is used in the manner shown in the cut, and the necessary rubber tubing, wire, etc., including a cut-out switch, for starting and stopping motor.

We will furnish the motor, pump and pencil, without the battery where desired, so as to permit photographers owning batteries to use theirs.

The Price of the above, complete, is $25. Without Battery, $18.

EVERY OUTFIT IS GUARANTEED TO GIVE SATISFACTION.

DIRECTIONS FOR SETTING UP PECK'S PNEUMATIC RETOUCHER FOR USE

TO CHARGE THE BATTERY.—When it is practicable, always make the solution in some large earthenware vessel, and allow it to cool before setting up the battery. Dissolve one package of caustic potash in enough water to fill the jar up to the first line Immerse the plates in the solution. Raise one side of the lid high enough to pour the contents of one of the bottles of oil into the solution. Repeat operation with each cell.

TO CONNECT BATTERIES.—Attach the wires exactly as you find them when receiving the battery, viz.: Connect the zincs of one battery to the copper oxide plate of the other. Place the battery under a table and screw the switch to the top of same beside the motor. Fasten the wire to the motor. Fasten the motor down to the table. Attach the tubing to the pumps and to the pencil. Everything is now ready for use.

TO REGULATE THE STROKE.—Loosen the thumb screw on the fly wheel of the motor, and move the sliding bar to or from the centre as may be desired. The nearer the centre it is the finer the stroke of the pencil will be. Moving it further out increases the force but diminishes the rapidity of the stroke of the pencil somewhat.

FOR SALE BY ALL DEALERS.

H. A. HYATT, MANUFACTURER AND TRADE AGENT,
PHOTOGRAPHIC SUPPLIES,
N. E. COR. EIGHTH AND LOCUST STS., ST. LOUIS, MO.

NEW AND GOOD.

MERCK'S SUPERIOR PYRO.
WYETH'S COMPRESSED TABLETS.
WOODBURY ANTIPYR.
S. P. C. ACID FIXING AND HARDENING COMPOUND.

TRY THEM. **FOR SALE BY ALL DEALERS.**

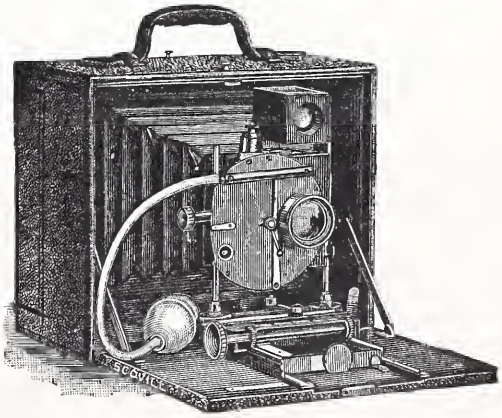
The result justifies the expense.

$55

buys a Henry Clay Camera, and you get a $55 result in every picture.

Our Henry Clay Manual tells all about it. Free.

Scovill & Adams Co.,
423 Broome Street, New York.



GEO. L. DAMON, PRESIDENT. J. DEXTER RECORD, VICE-PRESIDENT. GEO. D. LEAVITT, TREASURER.

New York Dry Plate

MANUFACTURED BY

New York Dry Plate Company,

BRANDS:

RECORD	HARVARD	CRESCENT
Extreme Rapidity.	Rapid.	Slow.

Orthochromatic, Non-Halation, Lantern and Tropical Plates.

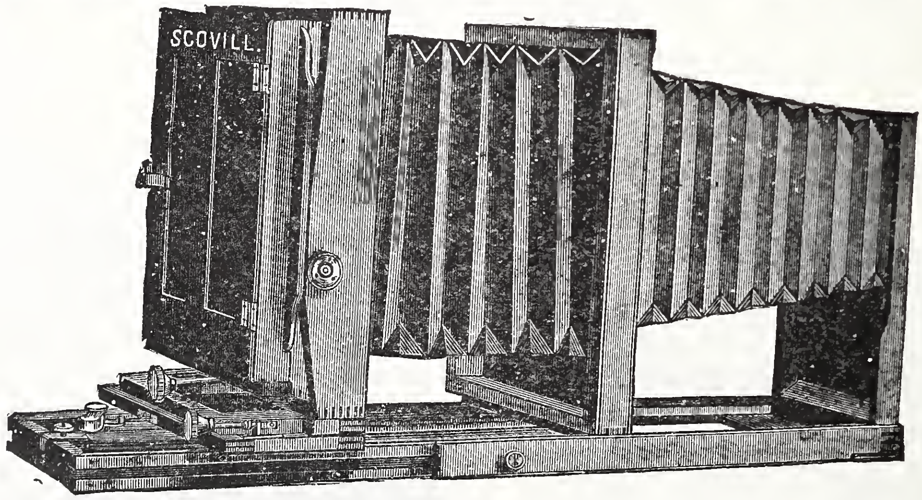
WORKS AT GUTTENBERG-ON-HUDSON.

OFFICE, 823 BROADWAY, NEW YORK.

The Record and New York Dry Plate Companies Consolidated.

THE AMERICAN OPTICAL COMPANY'S

UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5....	8x10	ins., with platform 30 in. long..................	$38 00
6 ...	10x12	" " " 36 "	48 00
7 ...	11x14	" extension " 48 " and vertical shifting front......	64 00
8....	12x15	" " " 48 " do	72 00
9....	14x17	" " " 60 " do	76 00
10....	16x20	" " " 65 " do	88 00
11 ...	17x20	ins., extension platform 65 in. long and vertical shifting front	90 00
12....	18x22	" " " 70 " do	100 00
13	20x24	" " " 72 " do	110 00
14....	22x27	" " " 72 " do	130 00
15....	25x30	" " " 80 " do	170 00

EVERYTHING FOR THE CAMERA.

Have You Tried the : : :

NEW ROSS-GOERZ LENS?

American Agent for **Ross Lenses.**

ROSS Portrait and View Lenses
ROSS-ZEISS Anastigmatic Lenses.
ROSS-GOERZ Double Anastigmats.

All Brands of : : :
DRY PLATES, PURE CHEMICALS AND SUPPLIES of all kinds.

ALL THE LATEST HAND AND TRIPOD CAMERAS.

Descriptive Catalogues of any of the above sent on receipt of five cent stamp for postage.

W. C. Cullen, 61 WILLIAM STREET,
New York.

ABSOLUTELY PURE.

We have at last obtained a Photo Blotting Paper (The Albion) which is absolutely chemically pure. It is a very different article from ordinary blotting paper, which always contains more or less impurities that are injurious to photographic prints. This paper may be used in the most delicate photographic operations with perfect safety. We had it especially made for photographers' purposes, and can unhesitatingly recommend it.

Price per Half Ream, -	**$12 00**
" " Dozen Sheets, -	**72**

ASK YOUR DEALER FOR

Albion (100 lb.) Photo Blotting Paper.

THE SCOVILL & ADAMS CO.,
SOLE IMPORTERS.

Felt Backgrounds.

The Scovill & Adams' Plain Felt Background, recently introduced, is a great boon to all Photographers, both Professional and Amateur.

It is made of strong, thick and even stock, and is of an agreeable neutral drab color. It is especially suitable for vignetting. The texture of the cloth absorbs instead of reflecting light, and thus produces soft effects, and agreeable depth in print. The liability of defacement by water stains is obviated.

The prices of these grounds are as follows:

4 x 6 feet	$2.50
5 x 6 "	2.75
6 x 6 "	3.00
6 x 7 "	3.50
6 x 8 "	4.00

These sizes may be sent by mail on receipt of 35c. extra.

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OR BY

The Scovill & Adams Co.
423 Broome Street, **New York City.**

Original American Dry Plate Factory.
ESTABLISHED 1878.

CARBUTT'S DRY PLATE AND FILM WORKS.

JOHN CARBUTT PROPRIETOR
TRADE MARK

Office and Factory : Wayne Junction, Philadelphia.

We reduce our prices to suit the times; see following price list:

AND HAVE NO CONNECTION WITH ANY DRY PLATE RING OR TRUST.

ECLIPSE and ORTHO. 27.

Process and "A."

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¼ x 4¼	$0 40	......	36
4 x 5	60	$0 80	36
4¼ x 5½	70	90	24
4¼ x 6½	80	1 05	24
4¾ x 6½	90	1 10	24
5 x 7	1 00	1 25	24
5 x 8	1 13	1 45	24
6½ x 8½	1 50	1 95	12
7 x 10	2 00	2 45	12
8 x 10	2 15	2 80	12
10 x 12	3 40	4 40	4

Reduced 10 per cent. from old list.

"B" 16 and 20.

Special and Ortho. 23 and 25.

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¼ x 4¼	$0 38	....	36
4 x 5	55	....	36
4¼ x 5½	65	....	24
4¼ x 6½	75	....	24
4¾ x 6½	85	....	24
5 x 7	94	$1 25	24
5 x 8	1 05	1 45	24
6½ x 8½	1 40	1 95	12
7 x 10	1 80	2 45	12
8 x 10	2 04	2 80	12
10 x 12	3 25	4 40	4

Reduced 15 per cent. from old list.

COLUMBIAN ANTI=HALATION PLATES.

Sens. 23 to 27. Eclipse and Ortho.

Sizes.	Plain.	Strippers.
3¼ x 4¼	$0 50	....
4 x 5	70	....
4¼ x 5½	80	....
4¼ x 6½	95	....
4¾ x 6½	1 05	....
5 x 7	1 15	$1 40
5 x 8	1 30	1 55
6½ x 8½	1 75	2 10
7 x 10	2 20	2 65
8 x 10	2 55	3 06
10 x 12	3 95	4 75

Larger sizes up to 24 x 36 at proportionate reduced prices.

CARBUTT'S LANTERN PLATES lead all other makes, 55 cents per dozen, 36 dozen in a case.

Specialties:
- Carbutt's Patent Dry Plate Lantern,
- Carbutt's Pyro and Potash Developer,
- Carbutt's Eiko-cum-Hydro Developer,
- Roxyline Enamel for Negatives and Positives,
- J. C. TABLOIDS, for Home use and Tourists.
- Color Screens for the PHOTO-CHROMIC PROCESS.

FOR SALE BY ALL MERCHANTS IN PHOTOGRAPHIC MATERIALS. SEND TO FACTORY FOR CATALOGUE.

Look out
for
imitations
of

WATERBURY CARDBOARD.

Look out
for the
genuine, too,
and see
that you
get it.

It is
the Best
and Cheapest.

CARBUTT'S "G.A" LANTERN PLATES.

THE UNIVERSAL PLATE.

Made on Specially Imported THIN CRYSTAL GLASS, Size 3¼ x 4, 55 Cents per dozen.

Are the perfection of Plates for producing Slides by contact, or reductions in the Camera. Their qualities are too well known to need further recommendation.

Owing to our new method of packing these plates, they are more perfectly protected and less liable to abrasion.

For Developer, we recommend either our EIKO-cum-HYDRO Two-Solution Developer, or our J. C. TABLOIDS. A powerful Developing Agent, allows one-half exposure. Price, 75 cents per box, post free, containing 96 Tabloids, enough to develop 8 to 12 dozen 4 x 5 Plates or Films, and twice or more that number of Lantern Plates.

CARBUTT'S GROUND GLASS TRANSPARENCY PLATES

For Making Beautiful Window Transparencies.

The above Transparency Plates were the ONLY onces receiving the World's Fair Award.

☞ SEND TO FACTORY FOR CATALOGUE OF PLATES AND SPECIALTIES.

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NOW IS THE TIME FOR FLASH-LIGHT WORK.

AND YOU WANT A GOOD MACHINE.

The Hunter Flash-Light Machine

IS THE BEST.

We have in this machine an apparatus specially arranged for the distribution of the light all over a large surface, and the system employed in igniting the powder is such that the greatest illuminating power possible is obtained from a given quantity of powder. As a matter of fact, this is over twenty times greater than the luminosity that would be obtained by burning the powder in a mass.

The advantages of this machine are that it can be taken apart or put together in less than three minutes. The tripod, although the lightest made, is the most rigid when set up, and can be raised higher and dropped lower than any other machine.

The principle employed is simple and practicable, consequently it is not liable to get out of order or fail when using.

The powder is thrown into the flame by the stroke of the hammer under the pan which separates and spreads the powder over a large surface, and so giving a far more brilliant light than would be obtained by the usual method of throwing the powder in the flame; as the powder being separated burns much quicker and the combustion is more perfect, not a grain of powder can escape ignition.

Where gas cannot be conveniently used the inventors recommend an alcohol machine devised by them. It is a very simple arrangement, and certainly to be preferred to the dangerous gasolin.

Send for circular giving complete description and directions.

PRICE, - - - - - - Only $45

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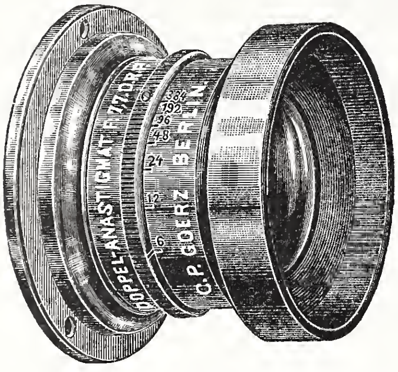

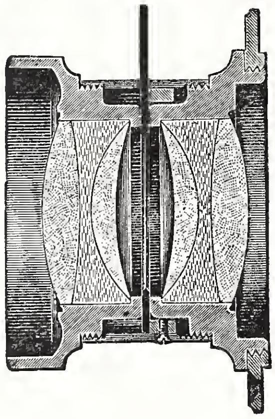

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Possessing wonderful marginal definition and depth of focus. . . . .

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Series III. F: 7.7 (angle 70-90°), universal extra-rapid lens, for portraits, groups, instantaneous photographs, landscapes, architecture, interiors and enlargements.

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Price List and information given, free of charge, on application.

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British Journal, 1893, No. 1728.
Wilson's Photo. Magazine, 1893, No. 440,441.
Wilson's Mosaic, 1893.

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Satisfies those who want the BEST.

For they are the standard of . . . .

Excellency, Rapidity and Uniformity.

To-day are even better than ever.

INCOMPARABLE for the Studio.
for Landscape Photography.
for the Hand Camera.
for Interiors.

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Our Celebrated Walpole Hypo.
(*Regular "Old Style" Large Crystals.*)

"New Process Walpole Hypo."
Trade Mark.
PUREST HYPO MADE.

Pure Walpole Sulphite Soda.

Products Unsurpassed.

Produce Fine Negatives.

Perfect Results.

Book on "Hypo" Free. **Photos** Exquisite.

ACETIC ACID,
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CARBONATE SODA,
COPPERAS,
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POTASH CARBONATE,
SODA ACID SULPHITE.

☞ We do not solicit retail trade. Where consumers cannot obtain our products from their usual sources of supply, we will furnish them on application; but it must be understood that in these cases we charge the full retail prices, and that cash must accompany the order.

Send 5 cents (stamps) for each sample or 25 cents (stamps) for 6 samples.

Walpole Chemical Co.,
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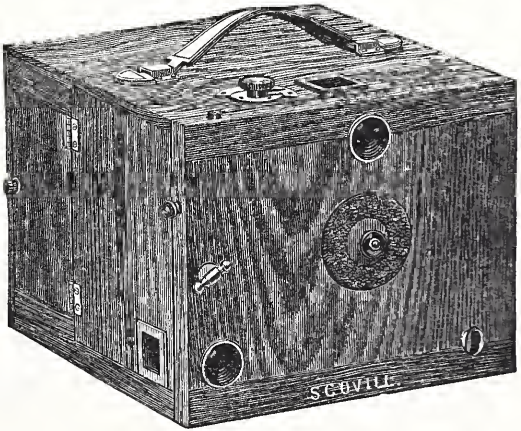
THE IMPROVED
ANTIQUE OAK
DETECTIVE CAMERA.



Which was introduced to meet the demand for a cheap Detective Camera within the reach of the youth, and of those who want to make but a moderate investment in photographic appliances, *has been made still cheaper.*

No. 1, 4x5 Antique Oak Camera, former price, $15.00, Reduced to $10.00
No. 2, 4x5 Leather Covered " " 17.50, " 12.50

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THE AMERICAN OPTICAL COMPANY.

FOR SALE BY ALL DEALERS, AND

THE SCOVILL & ADAMS COMPANY.

A PLATE

that has maintained the lead for years, by being the most reliable, the most Rapid, having the best printing qualities, and being easy to work, will prove to be

ECONOMICAL.

If you are looking to your own interest, you will

USE
CRAMER'S PLATES.

HAVE **U** TRIED

The Cramer Isochromatics?

IF not, WHY not?

They are the only plates on the market giving the full ISOCHROMATIC EFFECT without the use of a color screen.

Write for Descriptive Catalogue to

G. CRAMER, DRY PLATE WORKS,
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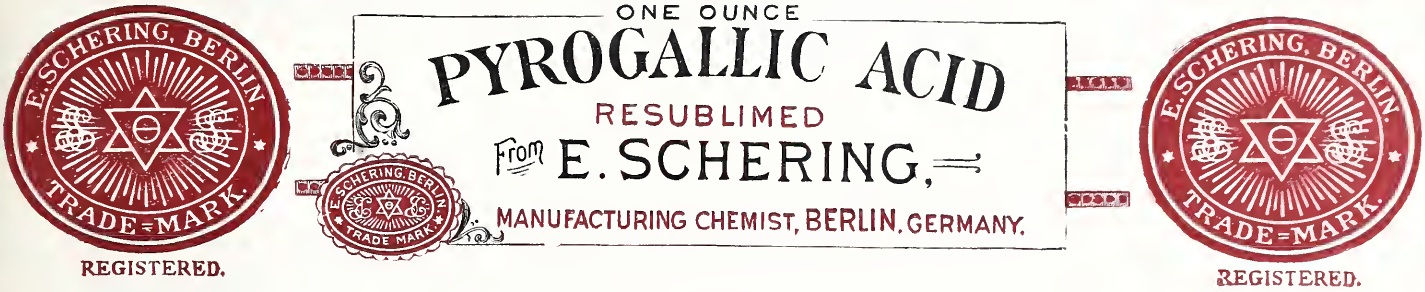
When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.



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See that you get the Genuine "Schering's." Excelled by none.

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Remember

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"Three Crown"

Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

THE CLIMAX PLATE.

THE LATEST PRODUCTION OF

THE STANDARD DRY PLATE CO.

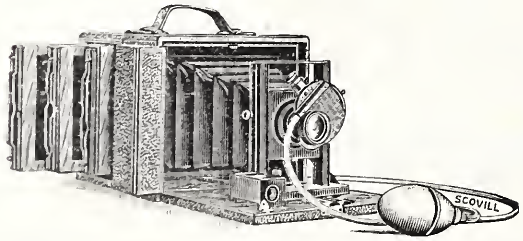
THEY ARE WORTHY YOUR TRIAL, FOR THEY ARE QUICK, CLEAN AND BRILLIANT, AND POSSESS THE VERY FINEST PRINTING QUALITIES.

THE PRICE, TOO, IS RIGHT.

ALL DEALERS SELL THEM.

The Henry Clay, Jr.

Partly owing to the march of progress, and partly to the present tight state of the money market, there has long been a demand for a hand camera which should possess all the necessary requirements for good work, but at the same time be obtainable at a reasonably moderate price. That we have successfully met this with our new Henry Clay Junior camera we think all will readily admit on seeing that apparatus. The superb workmanship of the Henry Clay camera is too well known to require any description from us, and we have only to say that, notwithstanding the considerable reduction in the price of the new camera, the finish is in almost every way equal. The Henry Clay Junior is now made in the two sizes, 4 x 5 and 5 x 7, and differs from the ordinary camera of these dimensions in certain points which we shall specify. It contains space for three holders, or six plates. A novel arrangement has been added by which the holders can be slipped into place without the usual inconvenience attached to such proceeding. The lens is a perfect little beauty, and does very fine work. The front portion has a sliding up and down movement for the lens, but no swing; indeed, with a hand camera this is but very rarely necessary, such objects that require it are best left alone with small cameras. The camera front can be fitted into position with the greatest ease. The movement is the work of a second; by pressing the catch the front of the box falls down, a piece of brass is caught hold of, the camera comes forward to the scale and, with one-quarter turn, it is fixed as firmly as a rock into position. The instrument is fitted with revolving diaphragms, reversible finder and an admirable little shutter, which can be used for time or instantaneous work. When closed the dimensions of the 4 x 5 camera are 5¾ x 7 x 6, including space for three holders. Altogether we can thoroughly recommend this instrument to all who require a first-class camera at a moderate price.



It is manufactured in the works of the famous

AMERICAN OPTICAL COMPANY.

Price, 4 x 5 size, $30.00, Price, 5 x 7 size, $38.00.

Including One Double Plate Holder.

Extra Holders for 4 x 5 size, $1.25 each. Extra Holders for 5 x 7 size, $1.30 each.

FOR SALE BY ALL DEALERS AND

THE SCOVILL & ADAMS COMPANY.

Some of our Specialties:

The American Optical Company's Apparatus

FINEST IN THE WORLD.

Swift, Steinheil and Zeiss (Imported) Lenses

ACKNOWLEDGED TO BE THE BEST

Gundlach, Bausch & Lomb, and "Waterbury" (Domestic) Lenses

WITHOUT RIVALS IN POPULARITY.

Morrison Celebrated Wide-Angle Lenses

THE BEST IN THE WORLD.

"Three Crown" Albumen Paper

ABSOLUTELY WITHOUT FAULTS OR BLEMISHES.

Waterbury Cardboard THE UNEXCELLED.

Merck's Superior Pyro, Andresen's (and Hauff's) Amidol, and Andresen's Sulphite of Soda

Prepared Developers AND OTHER SOLUTIONS, READY FOR USE.

"The Greatest Annual on Earth,"

AND OTHER PHOTOGRAPHIC PUBLICATIONS.

Ilotype (Collodion), B P & Nepera (Gelatine)

AND ALL STANDARD BRANDS OF ARISTOTYPE PAPERS.

All Standard Brands of Dry Plates

Wuestner's Orthochromatic "Imperial" Non-Halation and E. E. (Eagle Equitorial) Plates THE VERY LATEST.

The New Columbian Developer

FOR UNDER-EXPOSED AND VERY RAPID PLATES.

Woodbury's Antipyr

FOR HARDENING GELATINE NEGATIVES AND PRINTS

AND ALL STANDARD GOODS. **SEND FOR CATALOGUE.**

THE SCOVILL & ADAMS COMPANY,
423 Broome Street, New York.

If we say

Our Lenses are BETTER than ANY European product you may doubt us.

If we say

Our Lenses are as GOOD as the BEST you MAY believe us.

If we say

Compare our Lenses with those which YOU consider BEST, we secure your confidence.

Therefore we say

We make every variety of Lenses. When you contemplate buying, ask for one of OURS to compare with OTHERS. We give you a Test-Chart for this purpose. If OURS is ONLY as GOOD and CHEAPER, you will keep it.

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The Best Lenses in the World.

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Improved Euryscopes

THESE are made in seven different series, for **all kinds of work** in the studio, outside, snap shots, interiors and copying. Positively excelling all other lenses in speed, definition, roundness, depth, and other desirable qualities so dear to every first-class artist. Used and highly endorsed by the leading professionals and amateurs of the world.

We carry also a full line of

THE ZEISS ANASTIGMAT LENSES,

Made, according to the Zeiss formulæ, by Voigtländer & Son.

Also the celebrated

DARLOT LENSES For Portraits, Views and Stereopticons

☞ The Darlot Lenses are **surely genuine** when inscribed with our trade-mark "**B. F. & Co.**"

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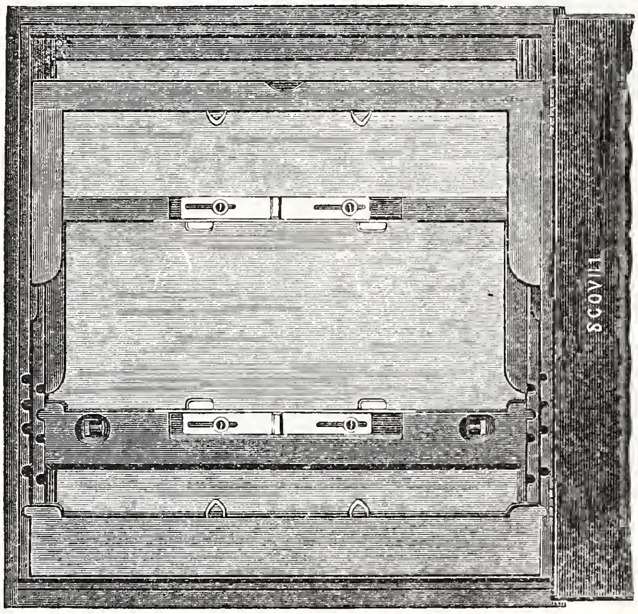
The S. & A. Photo-Engraver's Adjustable Screen Plate Holder



[Patent applied for.]

This holder, as is shown in the cut above, is a great improvement over any heretofore manufactured for photo-engraving purposes. Its principal points of superiority are, briefly:

(First)—The ease with which it is adjusted for different size plates and screens, by a simple sliding movement of the two inside frames to or from the centre, and thus dispensing with the expensive and troublesome use of kit frames.

(Second)—The convenience by which the screen plate is accurately adjusted to the sensitized plate by means of the metallic sliding adjusters. (Heretofore it has been necessary to do the adjusting by means of inserting different thicknesses of cardboard, paper, etc.)

(Third)—Different thicknesses in the screen plates are allowed for by means of a spring which always holds the plate in accurate place no matter what its thickness may be.

(Fourth)—A graduated scale on each screen adjuster makes it easy to always insure absolute accuracy in determining the distance of the screen plate from the wet plate.

(Fifth)—The simplicity of construction and excellent workmanship of the entire holder, being made, as it is, in the factory of the famous American Optical Company.

And, altogether, it is an ingeniously designed and beautifully constructed holder which will be found of indispensable aid to the practical photographer.

These holders are thicker than the ordinary plate holders, and if it is desired to use them on a camera the ground glass of which is focused for the ordinary plate holder, a new ground glass frame is necessary in order to adjust the focus. When ordering a holder to fit a camera in use, send the old holder or the old ground glass frame so that the new ones can be made to fit the camera. Also state the size of largest and smallest screen plate to be used in holder.

It is made in various sizes. Prices as follows :—

		Frames *only*: for Ground Glass.
8 x 10 Size	$15 50	$1 50
10 x 12 "	21 00	1 50
11 x 14 "	26 50	1 88
14 x 17 "	29 00	2 25
17 x 20 "	32 50	2 63
18 x 22 "	36 00	2 63
20 x 24 "	40 75	3 00

If adjustment from the outside of holder is desired, add $2.00 to above prices.

Send for Our Complete Catalogue of Photo-Engravers' Supplies.

THE SCOVILL & ADAMS COMPANY,

423 Broome Street, New York City.

DRESDEN PHOTO-PAPER WORKS

∴ ARE MANUFACTURERS OF ∴

CROSS-SWORDS

TRADE MARK. TRADE MARK.

DRESDEN EXTRA BRILLIANT ALBUMEN PAPER.
DRESDEN SATIN ALBUMEN PAPER.
DRESDEN KOSMOS COLLODION PAPER.
DRESDEN CELLOIDIN PAPER (BEST COLLODION.)
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Samples sent to Professionals on Application.

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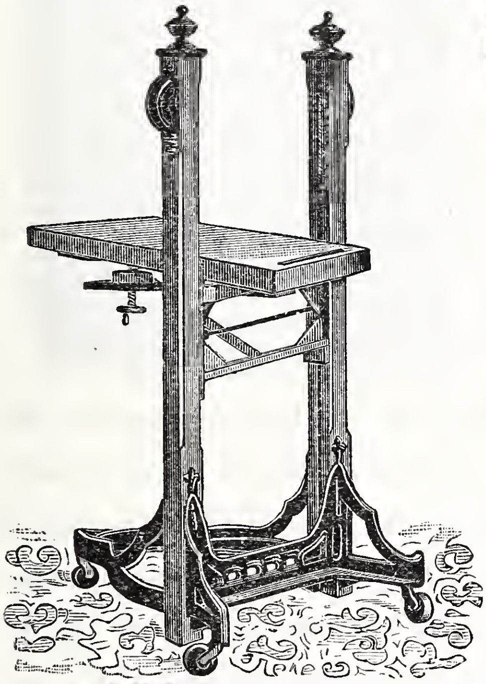
To that select, though
. . . limited class . . .

Who find beauty in any medium which tells the story of the negative fully, yet unobtrusively, and without useless accessories, we appeal.

A Blue Print paper capable of reproducing all the detail of the negative, having brilliant half tones and pure high lights, was unknown before we placed **French Satin Jr.,** on the market. With the introduction of our paper, however, all these desirable features were obtained, and a medium produced on which the finest pictures are easily and quickly made. All the troublesome baths necessary with the silver salts are avoided, and the print produced with a minimum of expense, both in time and labor.

Write for our Booklet. . . .

J. C. Millen,
Sole Manufacturer,
919 and 921 Arch Street, Philadelphia, Pa.



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The Semi-Centennial Camera Stand.

THE ONLY ONE THAT GIVES PERFECT SATISFACTION.

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TRY ONE AND BE CONVINCED
THAT IT IS THE BEST MADE.

All Dealers Sell Them. • • •

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AMERICAN OPTICAL CO'S
APPARATUS.

BEST IN THE WORLD.
SEND FOR PRICE LIST.

HORGAN, ROBEY & CO.

SOLE AGENTS,

34 Bromfield Street,
BOSTON, MASS.

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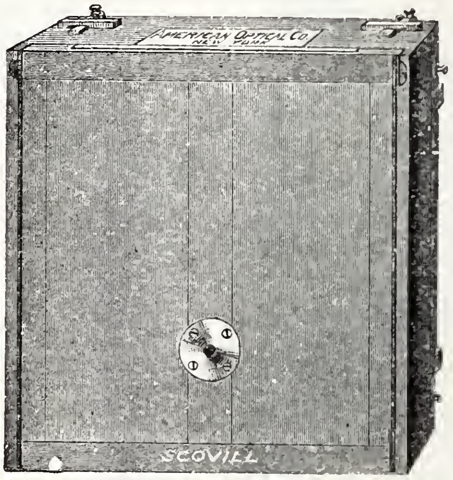

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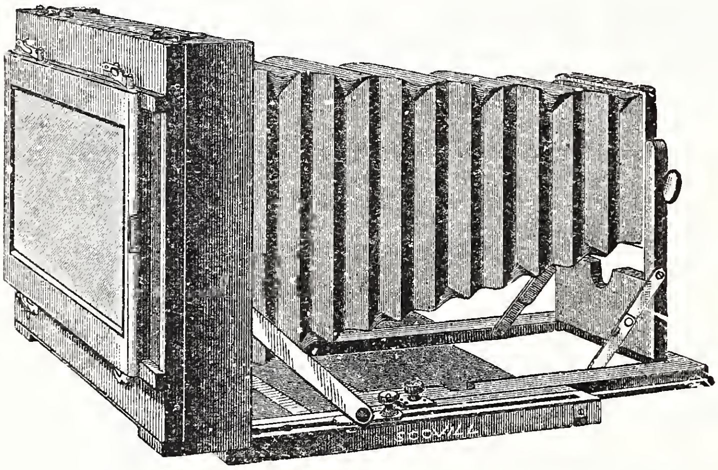

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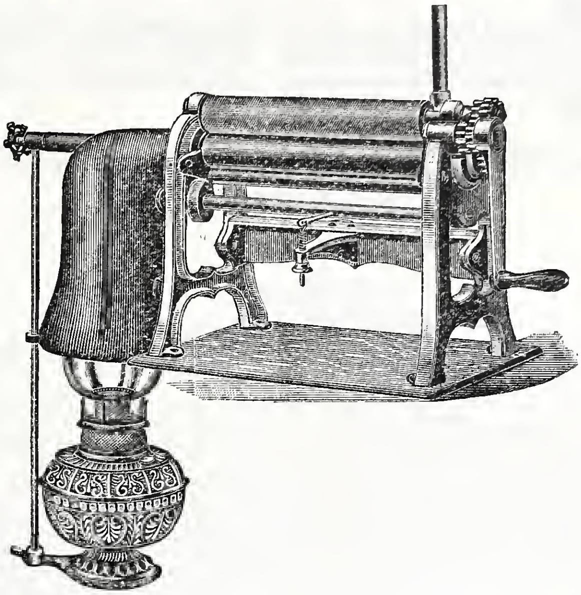

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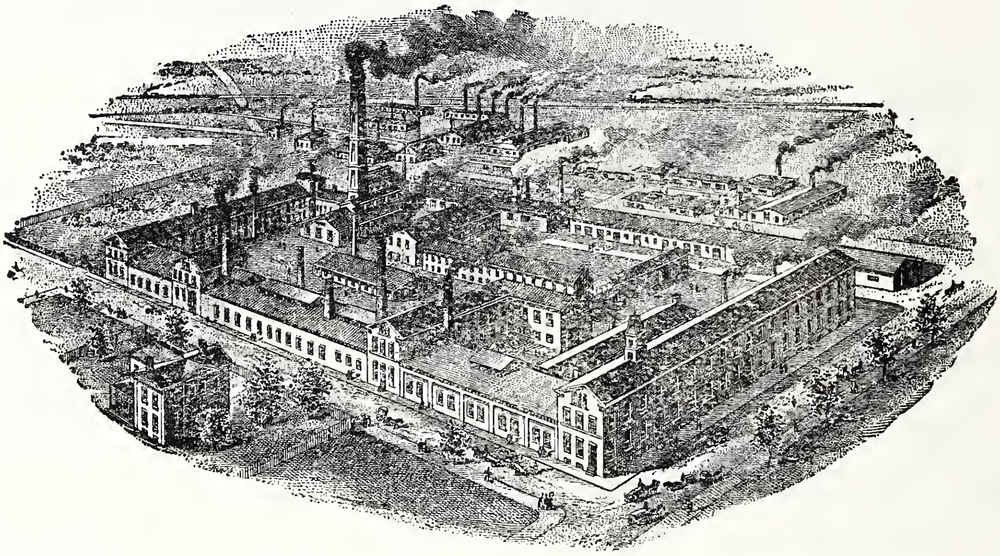

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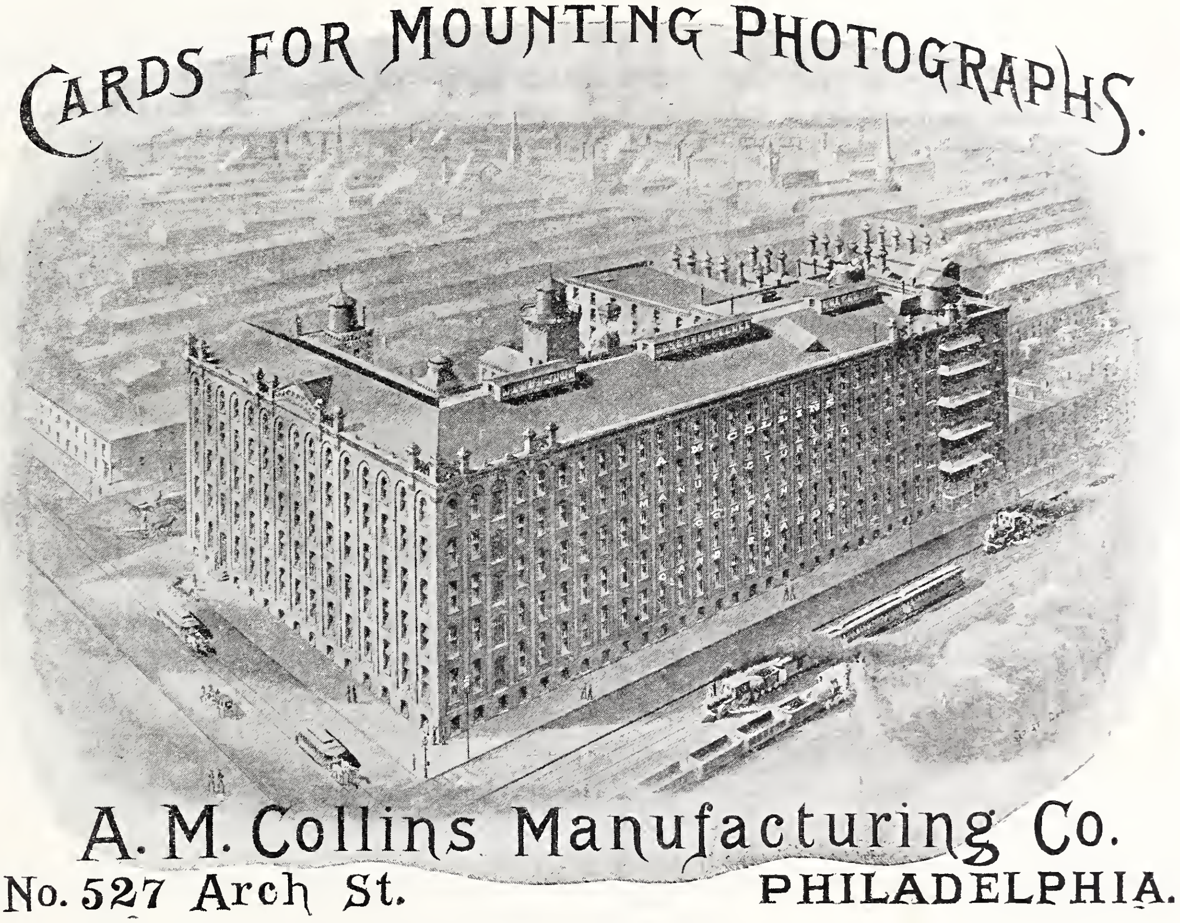

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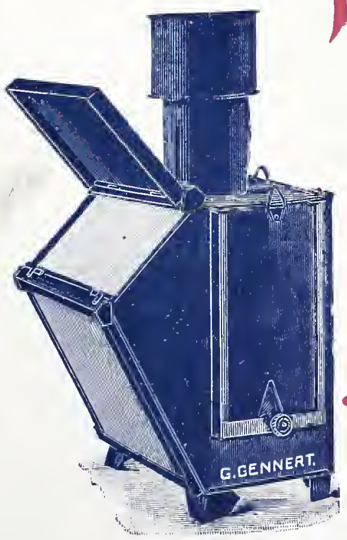

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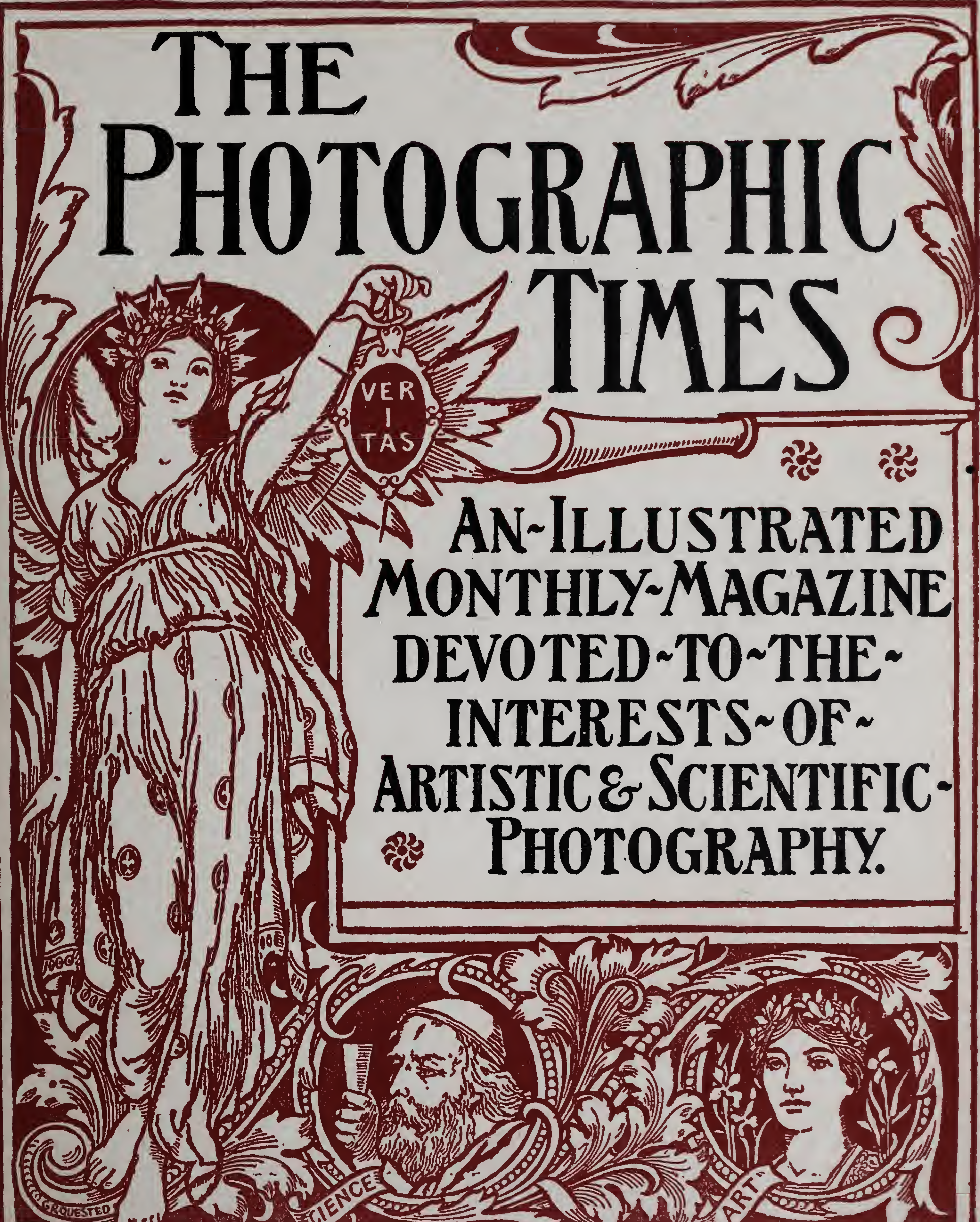

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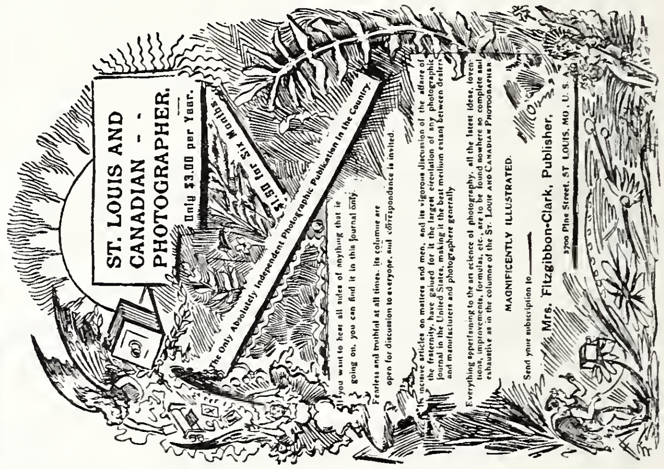

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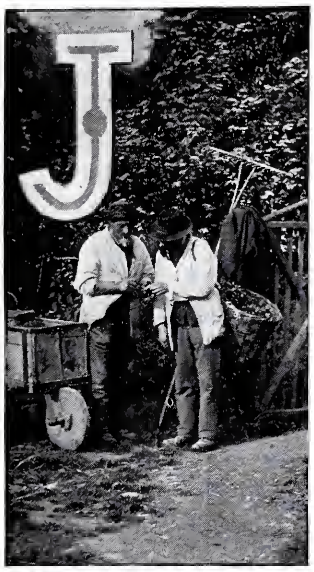
BLEAK DECEMBER.

THE PHOTOGRAPHIC TIMES.

Vol. XXVI. APRIL, 1895. No. 4.

THE MIRROR AND THE CAMERA.



By John A. Hodges.

A FRIENDLY OFFICE.

JUST how many photographers there are in this country it would be difficult to say, but we have no hesitation in asserting that ninety per cent. of them are at the present day complaining of the state of their business, and this same ninety per cent., or at least a very large majority of the photographers composing it, will be found working along in the same old-fashioned way. The public pass by their show-cases with a glance only, because there is nothing there to attract them. If a dry-goods store were to do the same thing, and every day expose the same old patterns, faded and shop-worn, where would their business be? and yet the photographer expects to rank as an exception. The majority take but little interest in their business; they rarely read the photographic magazines, and, consequently, know nothing of the many novel ideas and processes that are constantly being published, and which they might easily turn to profitable account. Now and then one meets with an exception. Quite recently a method of photographing a person in several different positions at one and the same time has been worked by a few professional photographers, and they have not lost money by the action. The idea caught on at once, not only with the general public, but manufacturers and others are utilizing it for commercial purposes. For instance, a ladies' bonnet is photographed; with one exposure and one plate five different views of the bonnet as worn are made, and ladies are able to see the effect from all points of view.

There are many different ways by which novel effects may be obtained through the combined effects of the camera and the mirror, and we purpose reviewing them here.

If two mirrors are taken and placed parallel to each other and a person placed between, the effect obtained is as shown in figure 1, where one soldier appears as a whole regiment drawn up in a long line. In making this experiment two large-size mirrors are required, and precaution must be taken that the reflections of the camera and the operator are not included in the picture. This can easily be done, and the effect is both novel and entertaining.

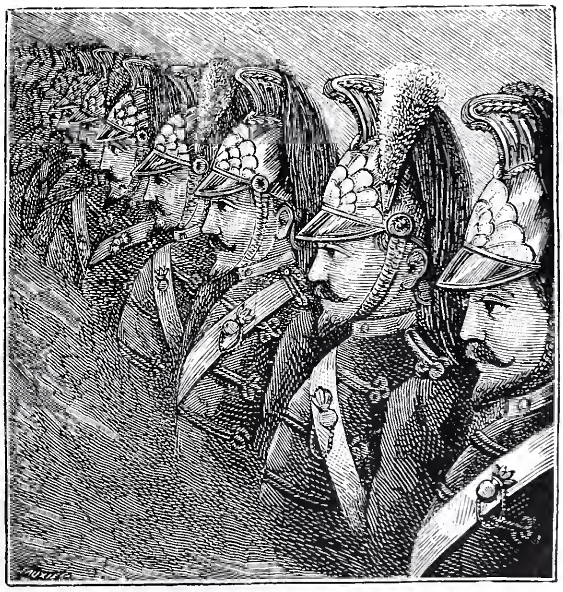


FIG. 1.—EFFECT OBTAINED WITH TWO PARALLEL MIRRORS.

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The process of multiphotography which we have already alluded to consists in posing the sitter with his back to the instrument as shown in Figs. 2, 4 and 5. In front of him are two mirrors set at the desired angle to each other their inner edges touching. In the illustrations here given the mirrors are inclined at an angle of 72 degs., and four reflected images are produced. When an exposure is made and the negative developed, we not only have the back view of the sitter, but the four reflected images in profile and three-quarter positions. In the diagram, Fig. 2, reproduced from *The Scientific American*, the courses taken by the rays of light, determined by the law that the angle of incidence is equal to the angle of reflection, are marked out. We see here their passage from the subject to the mirror and back to the camera. While up to the present we have only seen this arrangement used for gallery or portrait work, yet it is obvious that it might be used to advantage for quite a number of other purposes. The prison authorities should certainly adopt it for photographing criminals. For photographing various articles where it is of advantage to secure a number of different views of the same object without great additional cost, this method opens up a wide field of possibilities.

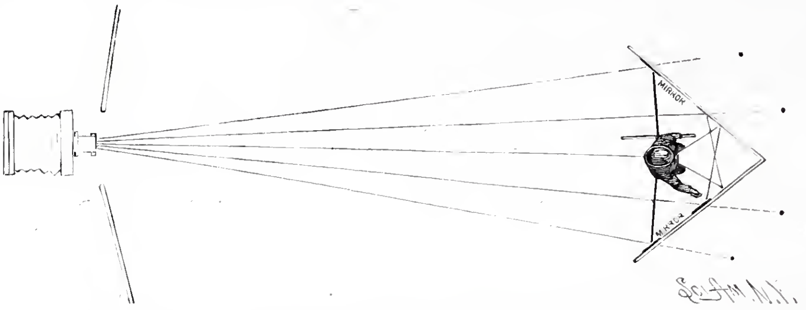
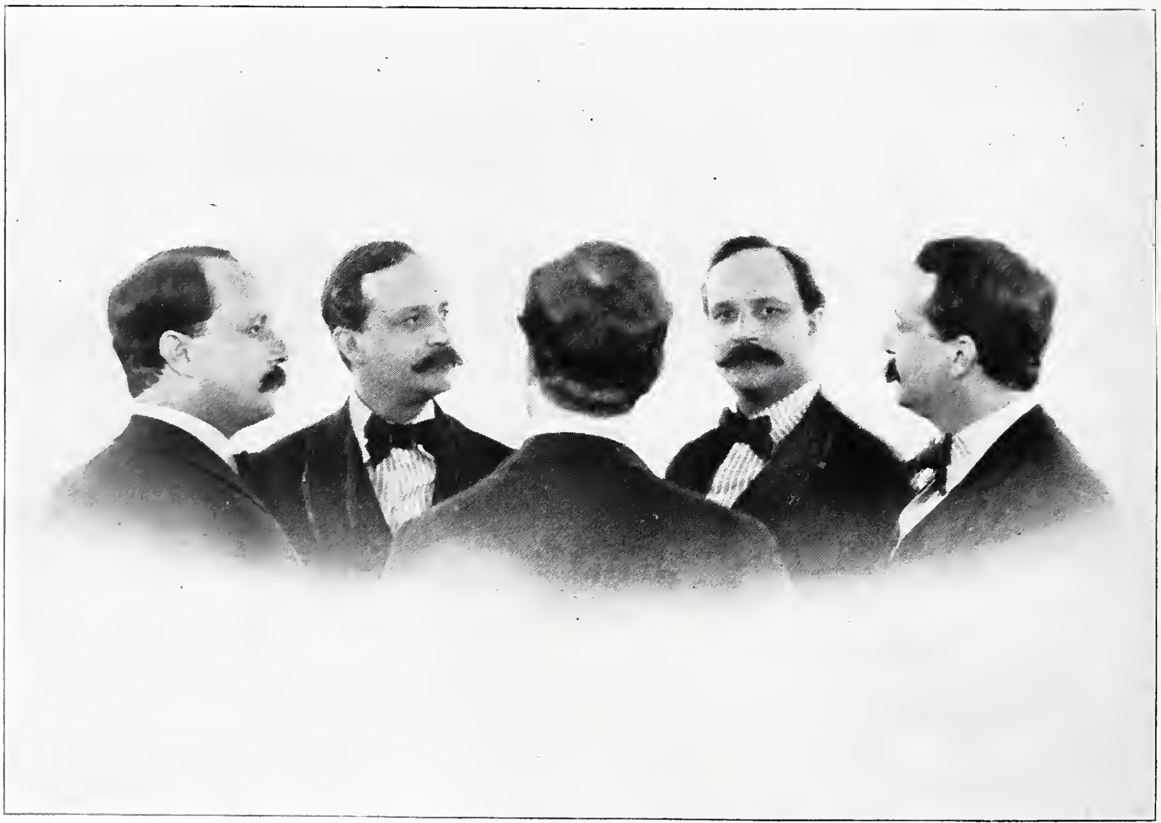


FIG. 2.—DIAGRAM OF THE PRODUCTION OF FIVE VIEWS OF ONE SUBJECT BY MULTIPHOTOGRAPHY.

The use of an ordinary mirror in portrait work has often enabled photographers to secure very pleasing effects. As an example take for instance Falk's child portrait, reproduced on the next page. There is often a very striking difference between the full and side views of a person's face, and, by means of such a combination as this, one is enabled to secure a perfect representation of both at the same time.

In making reflection portraits it has often



From "Photo Review."

By Hartley, Chicago.

MULTIGRAPH PHOTO.

been noted that the reflection has a more pleasing effect than the direct portrait. The reason of this is that it is softer and the facial blemishes are not so distinctly brought out. There is naturally a slight loss of detail, resulting in a far more artistic and more pleasing picture. This has induced a few photographers to make portraits of their sitters by photographing their reflection in a good plate-glass mirror. Of course the image is reversed, but this in most cases is of little consequence. We would suggest the use of a flexible mirror. In the hands of a skillful manager it might be used like Van der Weyde's photo-corrector. Mrs. Heavyweight might be photographed so as to resemble the Venus de Milo, and the thin man have a portrait made of him that would put Hercules to shame.

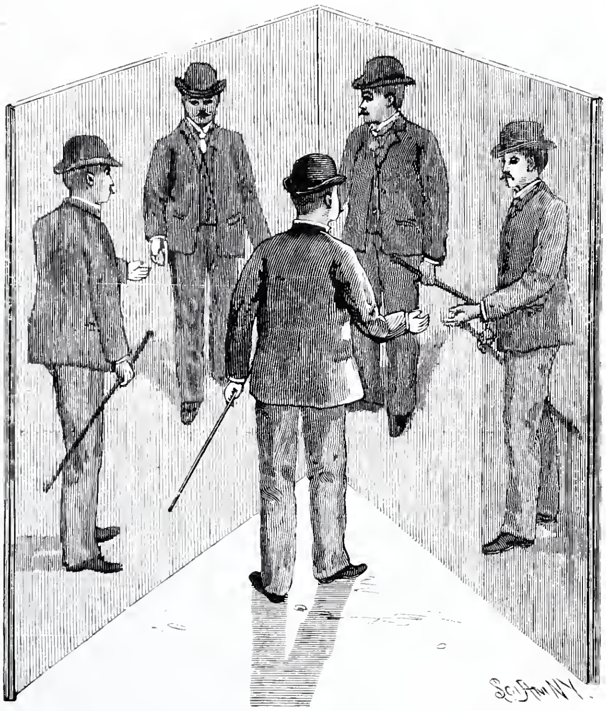
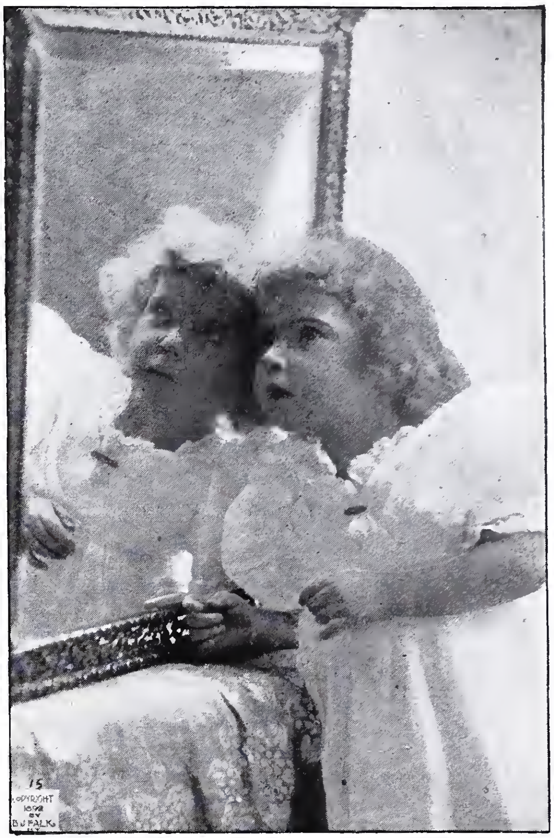


FIG. 4.—IMAGES OF A FULL-LENGTH FIGURE.



Copyright, 1892. By B. J. Falk

FIG. 6.—REFLECTION PORTRAIT.

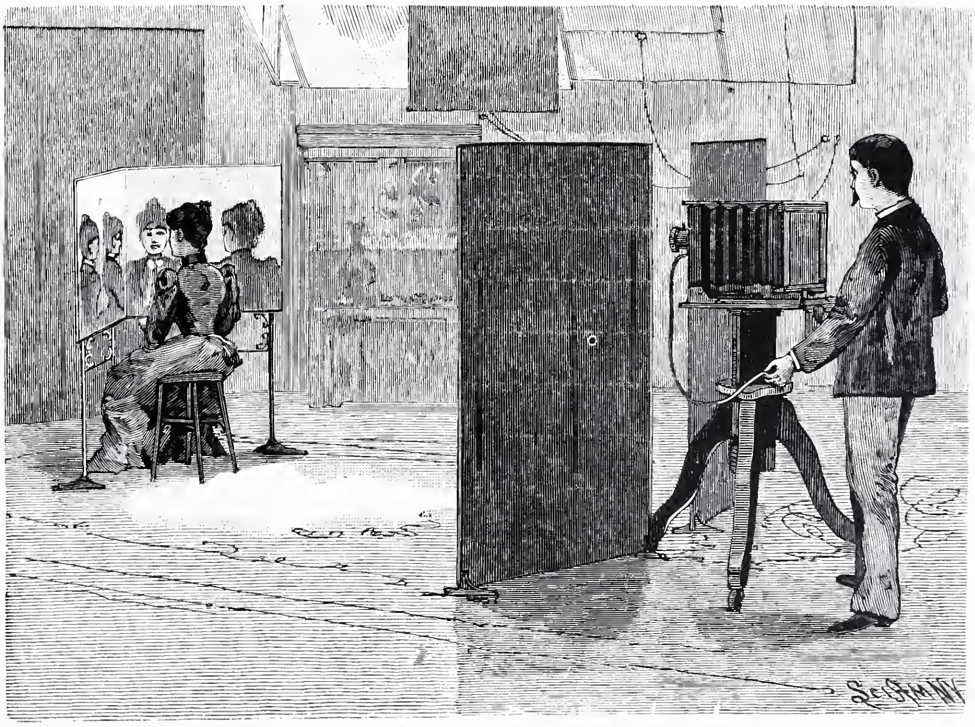


FIG. 5.—GALLERY ARRANGED FOR MULTIPHOTOGRAPHY.

Most amusing results can be obtained by the

NOTE.—We are indebted to the kindness of Mr. F. C. Beach of the "Scientific American," for the loan of figs. 3, 4 and 5.

use of convex mirrors; the thin man becomes an oblongated mass of humanity that Barnum would have given a big salary to, or if the position of the mirror is altered a widely different effect is the result.

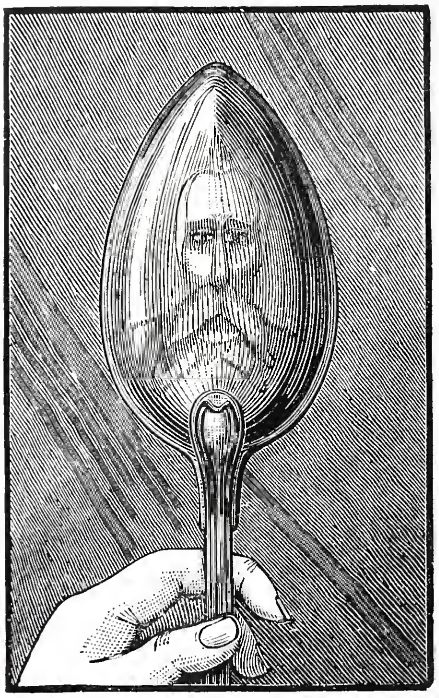


FIG. 7.—ELONGATED REFLECTION IN A SPOON.

By altering the mirror in various ways quite a number of ludicrous effects can be obtained (Fig 8 is an example), and these can readily be photographed. Even a well-polished spoon may be made to give curious photographic effects. (Fig. 7)

Many different formulæ for silvering mirrors have been given from time to time in this and other magazines. If we take a piece of rough, uneven glass and silver it, the most laughable reflections may be obtained.

The name anamorphosis has been given to two sorts of pictures, distorted according to a certain law, and which are of such a grotesque appearance that it is often impossible to recognize the subject of them; while viewed with a proper apparatus, they appear regular and take their normal appearance. One sort is designed to be viewed by reflection, the other sort is reconstituted by means of a special apparatus and rotatory motion. Until recently these pictures have been drawn approximately from the reflection of the object as seen in a convex mirror, whose position was indicated on the drawing, and which restored it to its real form. M. Fenant conceived the idea of employing photography for obtaining these pictures. Fig. 9 reproduces a photoanamorphosis from a negative by M. Fenant. If a cylindrical mirror be placed upon the black circle shown in the drawing, the photograph will appear in its original form. Our illustration gives a portrait, although the features are hardly recognizible. Indeed a great deal of fun can be had by making such portraits of friends and relatives, and trying to recognize them without the use of the cylindrical mirror. Similar pictures may be obtained by photographing the drawing or subject reflected in a cylindrical concave mirror placed perpendicularly to the drawing or in front of the subject. The second sort of anamorphosis is produced by the distortion of the picture in the sense of one of its dimensions. To reconstitute it, it is caused to rotate rapidly, at the same time that a disk, perforated with a slit, through which the picture is observed, is rotated in front of it at a slightly different speed.

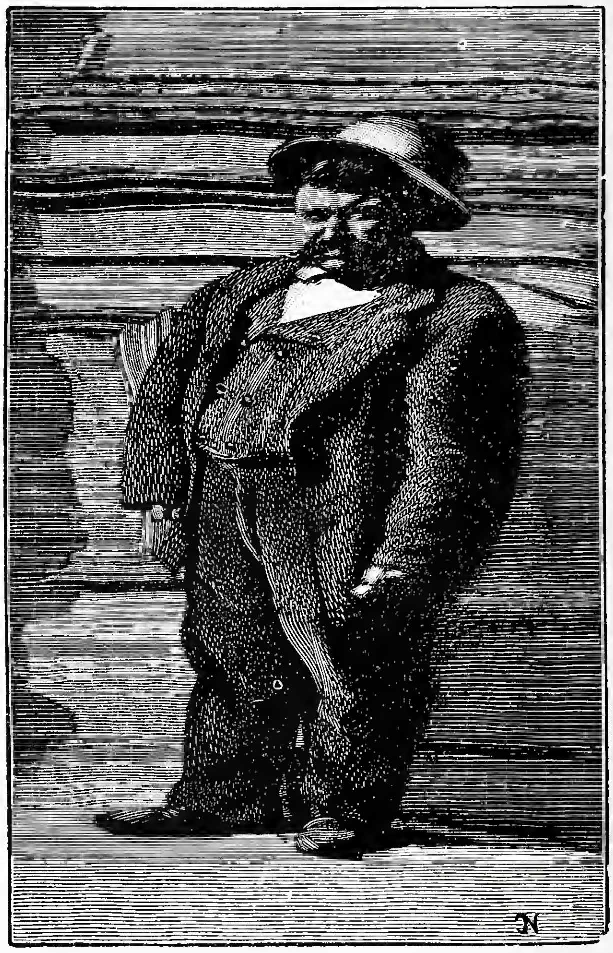


FIG. 8.—CURIOUS EFFECT OBTAINED WITH A CONVEX MIRROR.

The apparatus invented by M. A. Linde for producing the anamorphosis is shown in Figs. 10 and 11. G is a camera provided with a revolving plate-holder, T; H is a revolving disk, whose movement is made to bear a certain relation to that of the plate-holder by means of the band, f, and pulleys, D, D. The whole is set in operation by a clockwork and the band, F. A is the axis of the camera, B that of the plate-holder, and C, that of the revolving disk.

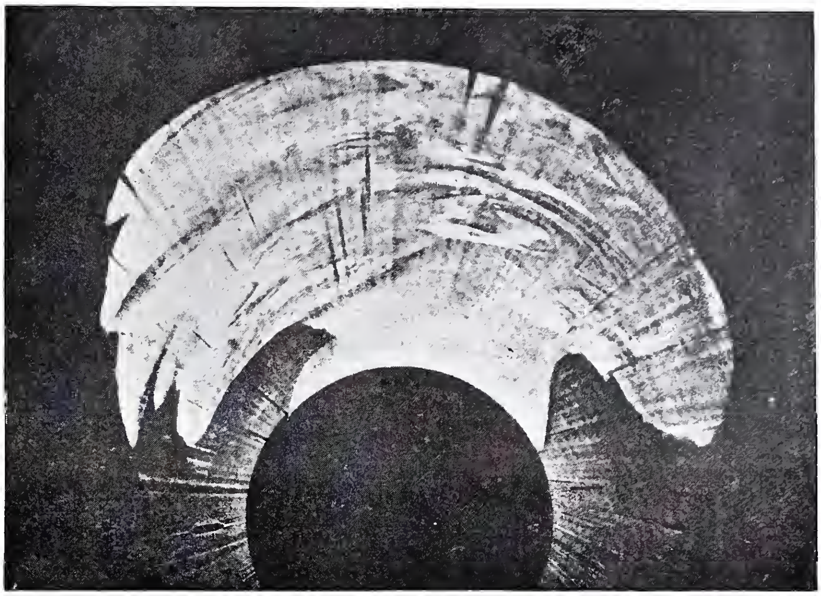


FIG. 9.—A PHOTOANAMORPHOSIS.

On this disk is fixed the picture of which it is desired to make an anamorphosis. The relative motions are so regulated that when the plate-holder has made a complete revolution, the disk has turned through an angle of 60 to 80 degrees in the opposite direction. Between the plate-holder and the objective is a diaphragm pierced with a slit 10 m.m. wide. The action of the light on the plate takes place through this slit. The negative obtained, prints are made on salted paper and rendered transparent; they may then be viewed in an ordinary apparatus such as is used for reconstituting the ordinary anamorphosis of this class.

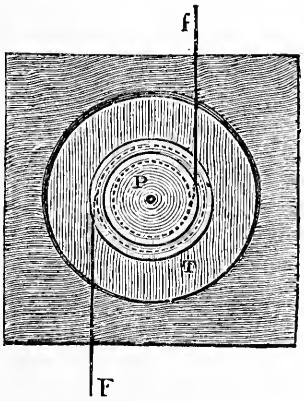


FIG. 10.

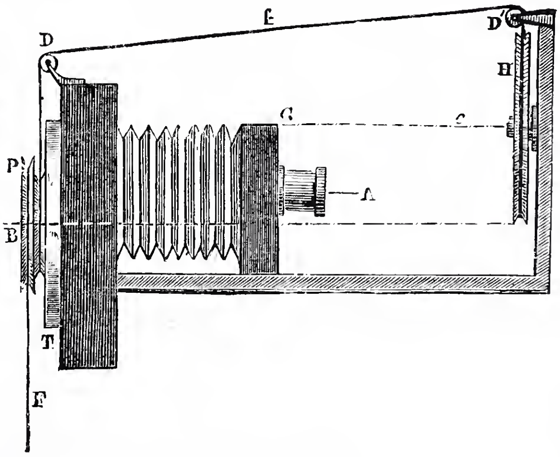


FIG. 11.

Unless grotesque or distorted results are desired, polished plate glass must invariably be used in making the mirrors. That is to say, if the silvering be done by the photographer himself, the following formula will be found to work well for this purpose. For it we are indebted to the kindness of Dr. James H. Stebbins, Jr., the well-known analytical chemist.

Dissolve pure silver nitrate in distilled water, in the proportion of 10 grains to 1 ounce, and carefully add, drop by drop, sufficient strong solution of ammonia to just dissolve the brown precipitate at first formed, stirring constantly during the addition.

Make a solution of Rochelle salts, 10 grains to the ounce of distilled water. Clean the plate of glass thoroughly with a little wet rouge, and polish dry with wash leather. Warm it before the fire or in the sun to about 70 or 80 deg. Fahr., and lay it on a perfectly level surface. Then mix 1 ounce of the silver solution with a ½ ounce of the Rochelle salt solution, and pour the mixture on the glass, so that every part of the surface will be evenly covered with it.

Allow this to stand in the warm sunshine from ½ to 1 hour, when the reduced silver will be deposited as a fine film over the surface of the glass. When this is done wash off the glass with distilled water, and wipe the entire surface very gently with a little wet wadding, which will take off the roughness, and render it easier to polish. When perfectly dry the silver should be polished by rubbing with some smooth hard surface.

The plate is then varnished by pouring over it a suitable varnish, and is ready for use.

PERMANENT PHOTOGRAPHS.

BY P. C. DUCHOCHOIS.

UNDER this heading I will describe some of the processes by which permanent photographs are obtained. None of them is new, but having been published so many years ago, they are most probably known by very few readers of The Photographic Times.

The first process we will describe is based on the reduction of the persalts of iron into protosalts by the agency of light. It was presented in 1858 to the French Photographic Society by Messrs H. Garnier and A. Salmon, for competition to the award offered by the Duc de Luynes for the purpose of solving the problem of rendering photographs absolutely permanent. The process is as follows:

A sheet of well-sized paper is uniformly coated by brushing with a very strong solution of ferric ammonio-citrate and, after drying in the dark, exposed to the action of light under a positive transparency for a period varying, according to the intensity of the transparency, from 8 to 12 minutes, in direct sun's light, 15 to 20 minutes in the shade in clear weather, and, of course, for a much longer time when the sky is overcast by dark clouds.

On the removal of the paper from the printing frame, the image is visible, but without vigor, and without details in the shadows; the ferric salt has been reduced to a ferrous compound, and the parts protected from the luminous action by the blacks of the transparency, that is, the image, still more or less possesses the property of attracting moisture.

To develop, the paper is pinned on a flat board, and, by diffused daylight, sufficient to enable the operation to be performed, one passes over the whole sheet a camel brush or a pad of cotton wool charged with very fine and very dry lamp-black. Generally no effect is at first produced, but by breathing upon the paper, the iron citrate not altered by light becomes sticky in absorbing moisture, retains the blacks, whereby the details of the image appear, and by continuing the same operation, the most faint are rendered visible. If the exposure has been too short, the whites take the black; if, on the contrary, the proof has been over-exposed, then the image is wanting in many of the details of the shadows.

The mode of fixation is very simple; it suffices to carefully immerse the proof in water, which eliminates the iron salt whether acted on or not. This done the proof is allowed to dry, then protected by a thin coating of gelatine, collodion, india rubber, or a varnish of some kind.

Instead of lamp-black, graphite, any color insoluble in water, metallic or vitrifiable substances in fine powder can be employed.

The difficulties in this process are; 1, the application of the lamp-black without soiling the whites, and, 2, the manner of developing which is liable to wash out the half-tints. In fact this is a dusting-on process.

Second Process.—This process is known under the name of the inventor, Mr. Artigues. The exact formula has never been published, but the following answers the purpose quite well:

Glucose, liquid	20 grains
Sugar	10 grains
Honey	5 grains
Gelatine	10 grains
Water	1 ounce

Dissolve by a water bath, then incorporate 3 drachms of lamp-black, let it cool, coat the paper by brushing and let it dry.

For use, the paper is sensitized by carefully brushing with a solution of 2½ per cent. of ammonium bichromate, hung up, and wnen dry exposed, prepared side in contact with the negative, for about ten minutes.

To develop, the proof is immersed in cold water and gently washed with a camel's hair brush until all the parts which have not been protected, and which are consequently soluble, are washed off and the image stands clear and sharp.

Third Process.—This process is specially adapted to the reproduction of designs and engraving in line, or of half-tone pictures obtained by means of a ruled screen.

It is exceedingly simple; a sheet of albumen paper is sensitized from the back with a solution of ammonium bichromate in 2 or 3 per cent. of water, and when dry, exposed, albumen side in contact with the negative until the image is plainly visible, it is then rubbed with lamp-black or any other color, finely powdered and immersed in cold water. The further operations are as described above.

Fourth Process.—Prepare a fluid starch paste (or the ordinary flour paste) and to it add india ink, Van Dyke brown, sepia, etc., then spread it on well sized drawing paper with a brush, so as to form an equal and not too thick coating; when dry, sensitize for five minutes by floating the paper prepared side upward, on a three per cent. solution of ammonium bichromate and, after drying, expose under a negative for a period of from five to six minutes in the sun, half an hour or more in the shade, according to the state of the weather. Now immerse the proof in water, two or three times renewed, for a few minutes and rub it under water with a camel's hair brush until the image is perfectly developed.

Fifth Process.—Prepare the two following solutions:

A.

Gum arabic	200 grains
Water	1 ounce

B.

Ammonium bichromate	30 grains
Water	1 ounce

Mix and filter through flannel. To this solution add about 300 grains of a suitable moist color, such as found ready prepared for aquarelle work. This proportion of coloring matter is not absolute, for the intensity of the image is reduced during the development. It is, therefore, necessary to make some experiments to ascertain the most durable quantity of color to be incorporated to the gum solution.

For a sepia tone one may employ three-quarters of sepia and one-quarter of red brown; for Bartalozzi red, one-quarter sepia and three-quarters red brown; the black tone is obtained with india ink; ivory black does not give satisfactory results.

The paper is coated as evenly as possible with a large camel's-hair brush and in a yellow light. It should be allowed to dry spontaneously in the dark.

It is not very easy to give any precise information as to the exposure time, it varying as usual with the intensity of the negative and actinism of the light. With a negative of the ordinary intensity an exposure of half an hour in the shade by a clear sky is generally sufficient. It is well, however, to make an experiment with a strip of the paper.

The development is the most delicate part of the operation. "Very simple in principle," says Mr. Rouillé-Ladevèze, who published this process in the *Bulletin* of the Photo Club de Paris, "since it suffices to use water at about 25 or 27 degrees C. to eliminate the bichromated gum not insolubilized by the action of light. This operation requires to be carefully done; to facilitate it, the proof is fixed on a glass plate by means of wooden clamps, then immersed into water to which a to and fro motion is imparted until the image appears entirely. By thus agitating the water, one can judge whether the exposure time is right. If the proof has been under-exposed, the image devolops quite rapidly, especially in the whites, and it is then well to slowly agitate the water. On the contrary, in cases of over-exposure, it is necessary to project a strong jet of water on the parts which appear with difficulty."

The development in the shadows wanting in detail may be facilitated by rubbing with a brush, and any impasted parts cleared with a soft sponge saturated with water.

All the processes above described yield, no doubt, good results in the hands of an experienced operator, but on the whole they are not very practical for the professional photographer who, to obtain absolutely permanent proofs, will always prefer the carbon process whose manipulations are so simple when printing from reversed negatives (stripped off or exposed from the back in the camera) thus dispensing with the double transfer.

PEASANTS. BY BARON C. PFAFFENHOFEN.

VIEW ALBUMS.

BY ALBERT GARDNER.

THE album of the amateur photographer and the collection of news gathered by the traveler are intended for the entertainment of friends, and the suggestion of reminiscence of past experience. To add to the album or views, appropriate quotations which shall describe or bear some pertinent or direct reference to each scene, is to enhance the interest of the book and increase its value as a source of entertainment. Usually this is done in a way which, while it may be and often is productive of an artistic result, such as a quotation from Edwin Arnold for a scene in India, or a verse from John G Whittier for a view in New England, leaves out the idea of personal association which, being introduced, would give to the book an added interest for those who see it. The introduction of the personal element by means of the quotation is, of course, not possible for all views. But there is much in literature suitable for the purpose, in which the pronoun I is a frequently repeated letter. By attaching a quotation of a personal character to a picture—the personality of the author or his character, to some extent, becomes transferred to the compiler of the album. It suggests the personal association with the scene. The same result may often be obtained by lines which lack the pronoun, but still suggest the album-maker's connection with the pictures. Let me illustrate my meaning by a work upon which I am at present engaged, in which I have assumed that the average of humanity enjoys a laugh or a smile as much as it enjoys art or literature. I have also assumed that my friends would find in the knowledge that pictures of places and people, more or less unfamiliar to them, were not only pictures, but illustrations of things that were a part of my own experience, a greater interest and entertainment than would be furnished by a mere collection of views. It has been my good or bad fortune, as one regards such experiences, to spend some time in the but little known region of the Blue Ridge mountains, far back from the beaten paths of travel. The few who know that geographically adjacent but socially distant section of our country will, I doubt not, concede with me that, in point of scenic beauty, it stands without a rival in the beauties of America. With such an environment as these mountains, I have naturally obtained not a few charming pictures. Most of my work has been done with an ordinary Waterbury 4 x 5 camera, which I have carried with me on horseback and in springless mountain wagons over rough mountain roads and trails, and on many a long tramp through the tangle of underwood on precipitous hillsides. The people, their houses and ways of living, as well as the scenery, have furnished subjects, and I have done, as well, more or less of the flora of the section, such as mountain laurel, rhododendron, yucca lily and passion flower. The dwellers among these hills, as is well known, form a unique class—of primitive character and habits of life, the result of isolation. Amid such surroundings one readily finds ample material for camera work. I did not, at first, see how I could fit quotations to such subjects as many of them make, and produce an interesting result to those who did not know the region. Both the number and range of the books at my command were limited, but I was amazed to find the fruitfulness of apparently unpromising sources. One would hardly think of going to The Pilgrim's Progress for apt quotations for a book of this character. Yet my title page bears two numbers from the pen of John Bunyan:

> "This little book will make a traveller of thee."

and

> "Now may this little book a blessing be
> To those that love this little book and me."

Between these two selections comes one from Shakespeare's Winter's Tale.

> "If you shall chance, Camillo, to visit Bohemia, * * * you shall see, as I have said, great difference betwixt our Bohemia and your Sicilia"

A birthday book, with quotations for each day in the year, proved a prolific source for certain subjects. Old magazines, a few odd copies of some of the poets, the poetry of the chapter headings in a set of Scott's novels, and school readers, were all made to furnish something for my work. No one need be deterred from a similar attempt by any apparent lack of material. A seemingly inappropriate source may furnish a line, which, from its sarcasm or utter absurdity of contrast will serve to supply the interest and amusement which appear to make this work of mine so entertaining to those who see it. For instance, to some very scrubby structures which in backwoods sections pass for hotels, where the beds are "terrors," and the food of the coarsest description, I attach such passages as these :

"One lodges but simply at Serchon."—*Owen Meredith's Lucile.*

"These mountain beds do not agree with me."—*Irving's Rip Van Winkle.*

"I starve here, God knows how, for a year or two."—*Browning's Fra Lippo Lippi.*

A decidedly desolate little mountain hamlet gets from Macbeth :

"If you will take a homely man's advice, be not found here."

While another, beautifully located, finds an apt description in Irving's Legend of Sleepy Hollow:

"A lap of land among high hills, which is one of the quietest places in the world."

A town of some five or six hundred inhabitants finds its fitting description in Pilgrim's Progress :

"A populous place, but possessed with a very ill-conditioned and idle set of people."

The same author provides for a place in which I was forced to put up with accommodations of the crudest possible sort.

"Oh ! world of wonders (I can say no less)
That I should be preserved in that distress
That I have met with here."

Cowper's Alexander Selkirk gave me for a desolate mountain village :

"Oh! solitude, where are the charms
That sages have seen in thy face.
Better dwell in the midst of alarms
Than reign in this horrible place."

Robert Browning furnished a quotation for a "shack" which was for a time my headquarters :

"Shall I sonnet-sing you about myself?
Do I live in a house you would like to see?"

To mountain cabins, built usually of rough logs, though sometimes of rougher boards, I applied such passages as these :

"*Falstaff*—'You have here a goodly dwelling and a rich'."

"This castle hath a pleasant seat ; the air nimbly and sweetly recommends itself upon our pleasant senses." —*Macbeth.*

"It was a lodge of ample size,
But strange of structure and device ;
Of such materials as around
The workman's hand had readiest found:
Lopp'd of their boughs, their hoar trunks bared
And with the hatchet rudely squared."
—*Scott's Lady of the Lake.*

For the fast decaying residence of a man who, from laziness and not from poverty, was allowing his house to go to pieces, I turned to the 18th verse of the 10th chapter of Ecclesiastics, which reads:

"By much slothfulness the building decayed, and through idleness of the hands the house dropped through."

The rudest kind of a rude hut, far back in the mountains, I found described in another selection from Pilgrim's Progress:

"As I walked through the wilderness of this world, I lighted on a certain place where was a den."

Lord Bacon helped me on another of these dens :

"Houses are built to live in, and not to look on."

Spenser helped on another :

"A little lowly hermitage it was,
Down in a dale, hard by the forest's side ;
Far from resort of people that did pass
In travel to and fro."

Goldsmith provided from another rude shanty the words :

"At night returning, every labor sped,
He sits him down the monarch of a shed.

Some of these, of course, show the personal association more by the implication of my familiarity with the scenes than by direct connection. But it is sufficiently obvious to be suggestive to my friends. With pictures of more general character, such as mountains, waterfalls, and flowers, I was forced, by my limitations at the time in the matter of books, to the use of such lines as were within my reach, and they are no more than either fittingly beautiful or beautifully fitting. That to some extent would be imperative in any case, but by lending variety is rather an advantage than a detriment. For a title page to my floral chapters, I use such lines as these :

"Buds and leaves and blossoms
Thou shalt see."—*Mrs. H. B. Stowe.*

"In graceful counterfeit of flowers,
These children of the meadows, born
Of sunshine and of shower."—*J. G Whittier.*

"Flowers are the sweetest things God ever made and forgot to put a soul into."—*H. W. Beecher.*

To a very pretty bunch of asclepias, I put—

"Here's flowers for you.

* * * * * *

These are the flowers of middle summer."
—*Winter's Tale.*

Others are fitted with such lines as the following :

"These laurels clothe the river banks with bloom."
—*J. G. Whittier.*

"A little bed of loveliness
That should never grow older."
—*R. H. Stoddard.*

"Flowers preach to us if we will hear."
—*Rosetti.*

Waterfalls of different character find fitting distinction in Meredith's Lucile:

"No sound through the stillness was sent,
Save the roar of the water."

And from Tennyson's Lotus Eaters:

"A land of streams! some, like a downward smoke,
Slow-dropping rills of thinnest lawn did go."

Two other picturesque falls enabled me to use Wordsworth's

"Come forth into the light of things;
Let Nature be your teacher."

And a passage from Sterne's Sentimental Journey:

"I pity the man who can travel from Dan to Beersheba and say 'Tis all barren.'"

Some pleasant woodland paths are well-adapted to Shakespeare's lines:

"Who would live turmoil'd in a court,
And may enjoy such quiet walks as these."

And the opening lines of Mitchell's beautiful hymn—The Palace o' the King:

"It's a bonnie, bonnie warl
That we're livin' in the noo,
An' sunny is the lan'
We aften traivil throo."

And I close my book, as I do this paper, with Mr. Dick Swiveller's farewell to his lady-love:

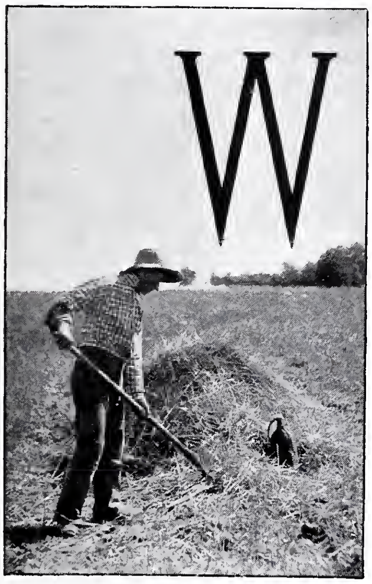
"I have merely to apologize for trespassing so long upon your attention. Good-night."

* * *

CHILD STUDY. BY J. F. RYDER.

THE MYSTERY OF SENSITIZING, TONING AND FIXING.

BY W. B. DIMON.



WHAT is toning? Among the earlier writers we find no use of this word, but instead they often speak of coloring. An investigation of the action of the ingredients used I think will prove them nearer right.

Let us first consider, What are the component parts of the paper upon which we have impressed our positive image by means of a negative?

A suitable paper, whose chemical construction will not interfere with our processes, is salted and floated upon an albumen bath, made of the white of eggs beaten up vigorously with chloride of ammonia, alcohol and distilled water. Sometimes the paper is treated to a salt bath previously, but more often the chloride is mixed with the albumen bath. Ammonium chloride is used for salting paper in place of chloride of sodium. This bath makes the surface of the paper glossy, assists to bring out the details very sharply, and, above all, prevents the image from sinking in, and makes the paper a more ready absorbent when in the silver bath. This work is generally performed by the commercial dealer or manufacturer to better advantage and at much less cost to the consumer. The unpleasant smell of many of these papers is due to the use of fermented albumen, which some claim will produce finer tones. Others allow the albumen to become partly decomposed, and, in that case, it gives the odor of sulphuretted hydrogen, which is very offensive and very dangerous to the permanency of the prints.

The process of sensitizing albumen paper has been fully explained by me on page 104 of the Annual for 1894. Chemically, the chloride contained in the albumen unites with the nitrate of silver, forming silver chloride and nitrate of sodium, and silver nitrate is also absorbed by the albumen, part of which is converted into albumenate of silver. Nitrate of sodium has no further effect and no attention need be given it. The utility of the nitrate of silver will be seen further on. The sensitized paper, charged with silver chloride, is now ready for contact exposure with the negative.

It is an established fact that no substance is sensitive to light when perfectly pure, dry, and alone by itself. The action of light is to separate a whole or part of a non-metal from the metallic silver with which it is combined. In this case it is the non-metal chlorine. The light separates the chloride of silver into silver sub-chloride and chlorine. Unless there is some substance present with which the chlorine can combine when liberated, the light will be unable to decompose the silver chloride. Water will perform this office, but silver nitrate, one of the products spoken of above, will quickly seize the chlorine and dispose of it, leaving a dark deposit of silver sub-chloride. Now we have the basis of our image stamped upon the paper in silver sub-chloride. This is the condition of our print when taken from the printing frame, and is rarely pleasing to the eye, sometimes being violet, bronze, or red, as in the case of many new papers on the market at the present day. It is evident some step must be taken to prevent the further action of light upon the silver print, and that is the fixing.

Were we to fix this at once, without toning, the resulting color would be a dirty brick red. We may assume this then to be the color of our sub-chloride of silver. Silver in any condition is very liable to tarnish, and eventually would prove the color faulty even if its present color was pleasing to the eye.

Space will not permit me to follow out the various devices and processes adopted by our predecessors for changing and establishing a color durable and pleasing; but, suffice it to say, for a long time they steadfastly adhered to acid baths.

By accident an alkali bath was once used and resulted in making a valuable progressive step in the methods of coloring, of which now there are many. I shall undertake to explain only one, which may be considered typical of all, and for that purpose have chosen the chloride of gold and acetate of soda process, the one most used by professionals. Gold is not subject to tarnish or to be affected by the atmosphere. It will retain its color well under most all circumstances, which is not true of the silver. Our object now is to change this very unsatisfactory brick-red color of the sub-chloride of silver to a soft brown or black.

It is well known that gold finely divided may be of many shades of color, from a deep blue to a ruby red. The combined effect of the deep blue of the gold and the red of the silver sub-chloride will give the black-colored tints we wish. Through the close affinity of these two noble metals for each other we are enabled to make a deposit of gold upon the silver somewhat upon the principle of plating metals.

This deposit, or gilding, however, must be of pure gold. For this purpose we use chloride of gold in solution combined with an alkali which will unite with and set free the chlorine. In our typical case acetate of soda performs that function, and the gold is deposited upon and takes the place of the silver sub-chloride. The chlorine unites with the acetate and sodium, and also with the hydrogen in the water forming sodium trichlor acetate, which is harmless, and hydrochloric acid, which tends to restrain the action and return the chloride to the silver, thus maintaining the undesirable red color.

As explained in my article entitled "Mystery of Developing," in March TIMES, this product must be neutralized or disposed of, that the work may go on. For this purpose a pinch of bicarbonate of soda introduced will dispose of the acid. Thus it will be seen the bicarbonate of soda becomes an accelerator to the toning bath. If there is not a sufficient quantity of alkali present in the bath to liberate and absorb all of the chlorine, it will re-attack the silver and annul the action of the gold, resulting in flat prints.

The object of washing prints thoroughly before they are immersed in the toning bath is to clear them of free or surplus silver. The last bath should contain chloride of sodium (common salt), to neutralize the greater part of the nitrate of silver, which, in too great a quantity, prolongs the toning too much. The residue must be washed out with pure water, after taking them from the salt bath and before toning.

Thus it will be seen that the products arising from exposure to light in the untoned print are reducing agents. They decompose the gold salt and attract the pure gold to themselves. The other ingredients serve to clear away the ashes and keep up the action. The unaltered silver chloride possesses no reducing power; therefore the white parts remain untouched. The chlorin unites with the hydrogen in the water, forming hydrochloric acid. The function of the acetate is to neutralize and dispose of this retarding product, turning it into carbonic acid, which passes off as a gas. Thus the chlorin is prevented from attacking the sub-chloride of silver, and leaves it clear for the gilding by the gold. The gold changes the color by its combination, and thus the whole object is to color the silver. Is not the process then coloring and not toning? It is useless to retain old toning baths. They are charged with waste products of chlorin and nitrates, which do not aid but tend to help form weak prints.

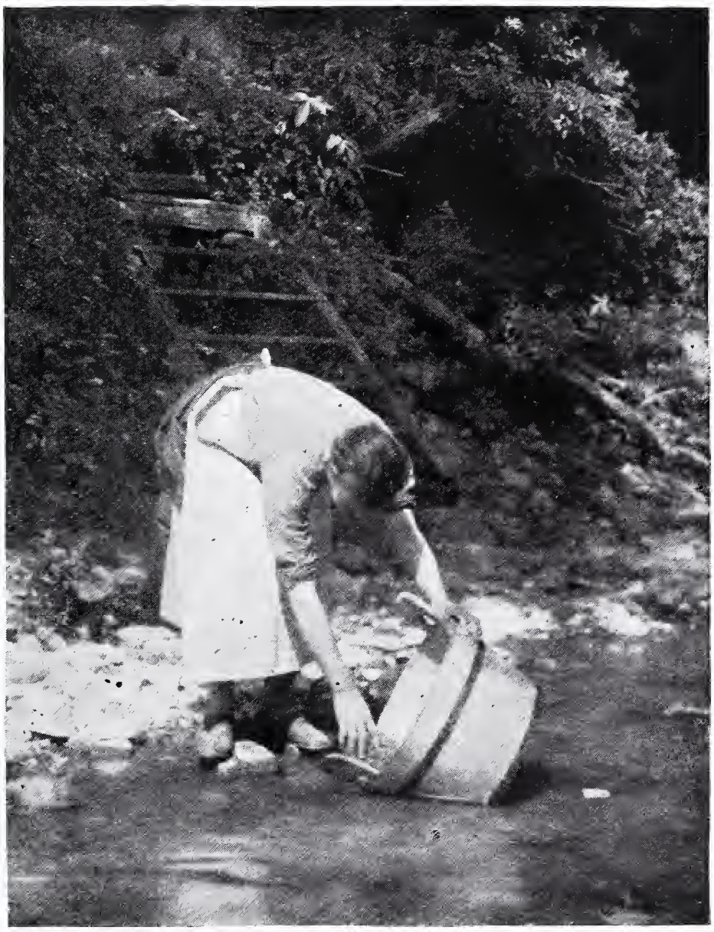
After coloring or toning we have a great number of particles of black metallic silver forming the picture, and around and between them are particles of silver bromide or chloride, which have not been affected by the light.

If the print or plate is now exposed to the light these remaining particles will be changed to metallic silver, and the entire surface will be blackened, and all trace of the picture lost. What is called fixing is really the clearing out of all these unaffected particles of silver bromide or chloride.

A substance is wanted that will dissolve these particles without acting upon the metallic silver. After much experimenting by many persons hyposulphite of soda has been determined upon as the best agent for this purpose. W. Jerome Harrison claims the term fixing to be inappropriate, and that the term clearing is more in accordance with the facts. When a negative or print is placed in a solution formed of this agent there is formed a silver sodium sulphide and a sodium bromide or chloride. The former compound is very readily dissolved in water, and is easily washed out. The latter is harmless to effect any change. Hence it is, strictly speaking, a clearing of the débris, and should be called clearing, and not fixing. The fixing was done by the gold's action on the silver.

If an insufficient amount is used another compound is formed which is insoluble, and cannot be washed out. If the fixing bath becomes acid, sulphur, sulphur dioxide and sodium chloride will be formed. The sulphur deposited will combine with the silver and form sulphide of silver, which has a yellowish hue. Therefore the clearing bath should always be kept alkaline. Thorough washing of prints in running water for not less than one hour will wash out all the sulphur and hyposulphite of soda compounds, and must not be neglected.

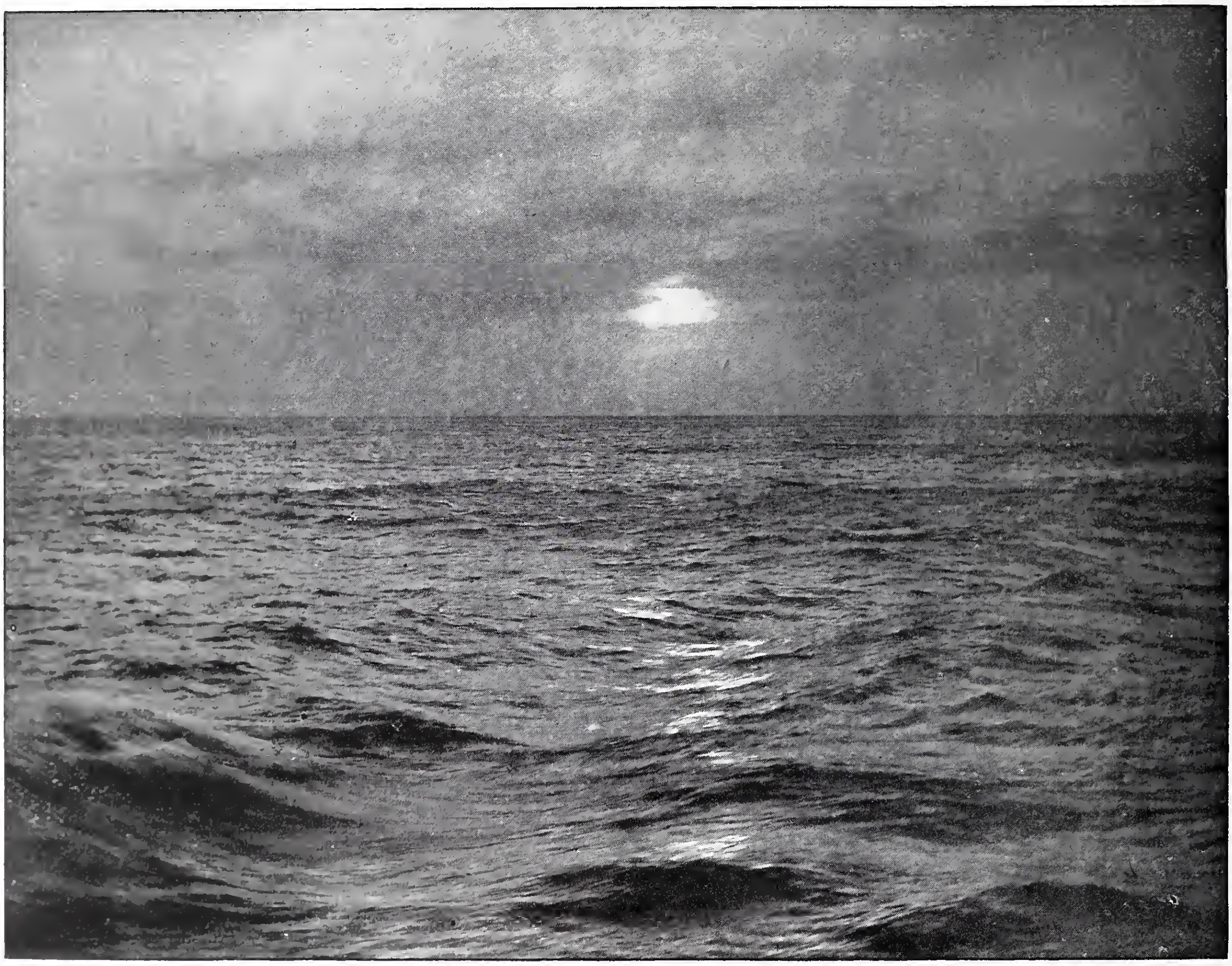
In this article I have not attempted to cover all phases of the work. There are many and different methods, with an equal number of combinations, bearing a similarity in the process to obtain the same chemical result, all of which are exemplified in this typical method I have explained. To the student the field is rich and large.



AT THE BROOK. BY ALFRED STIEGLITZ.

OUR SEASCAPE COMPETITION.

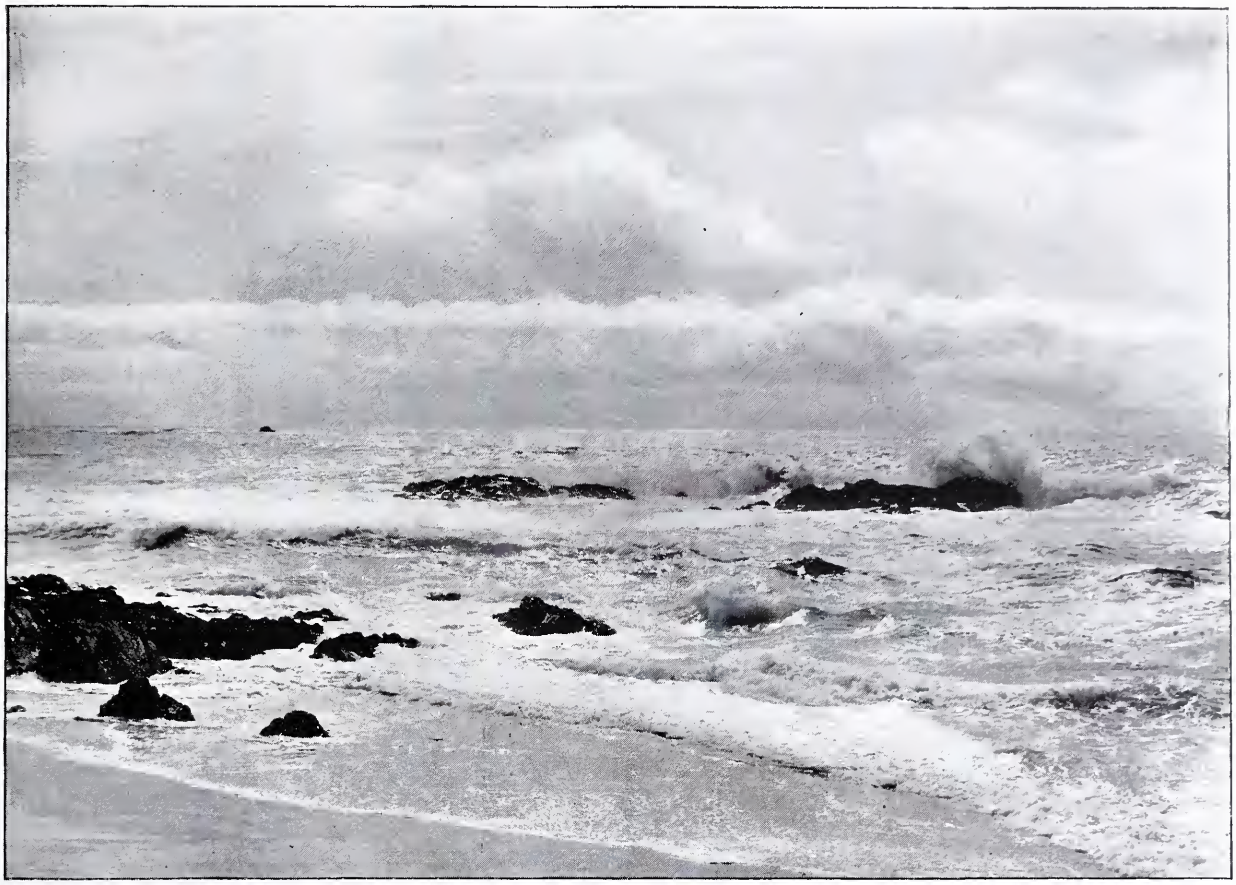
OUR fourth, or seascape competition was not the success we had hoped. Being limited to a certain class of work which only a few amateur photographers are able to take up with, the number of entries was naturally below those of our landscape and portrait competitions. The quality of the work was also inferior to what we had hoped for, considering the possibilities, and the work we had already seen in this direction.



THE OCEAN. BY F. V. CLARKSON

The judging was entrusted to Mr. Alfred Stieglitz and to Mr. Carlton T. Chapman, one of the most successful seascape artists of this country.

Our usual system was adopted; each judge worked independently of the other, awarding a certain number of marks. Miss E. V. Clarkson and Mr. W. B. Post, two names well known to our readers, both received the same number. Under ordinary circumstances we should have awarded each a silver medal, but we did not think that the work was of a sufficiently high order to warrant this, and in this opinion we were supported by one of the judges. We therefore withheld the silver medals and awarded a bronze medal to these competitors. We do not wish our action to be misconstrued, and that we award bronze instead of silver medals from any paltry mercenary motives, for paltry it would certainly be. Our intention is to make the silver medal of THE PHOTOGRAPHIC TIMES a prize worth striving for, and when won the recipient may feel proud of his achievement. A medal that is given indiscriminately at every competition for pictures which are the best sent in, irrespective of their individual merit and the quality of the whole work, are not in our opinion worth competing for. It will give us the greatest pleasure imaginable to award our silver medal every time to work which shall be



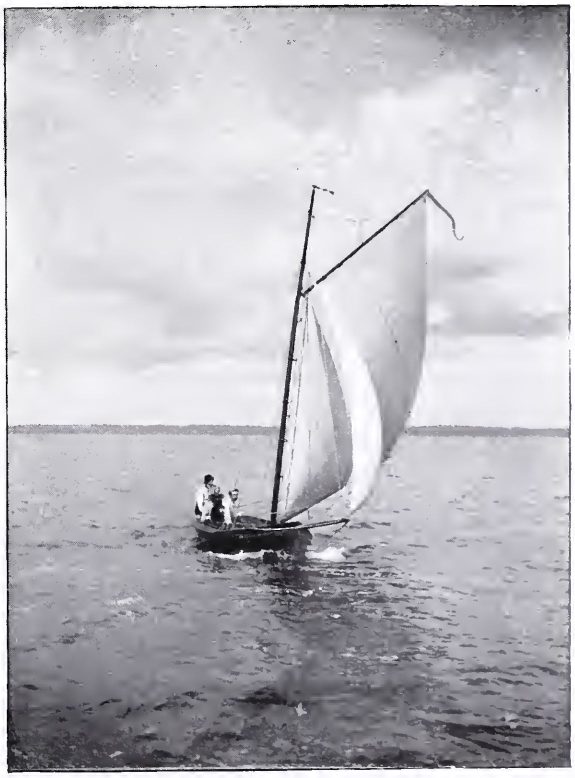
SEAL ROCKS. BY W. B. POST.

sufficiently good to merit it. Twice we have been compelled to withhold it, and up to the present only one has been awarded.

The picture sent in by Miss Clarkson entitled "The Ocean," we reproduce herewith. The original is a carbon enlargement from a small negative. The little patch of light breaking through the clouds is effective although a trifle patchy.

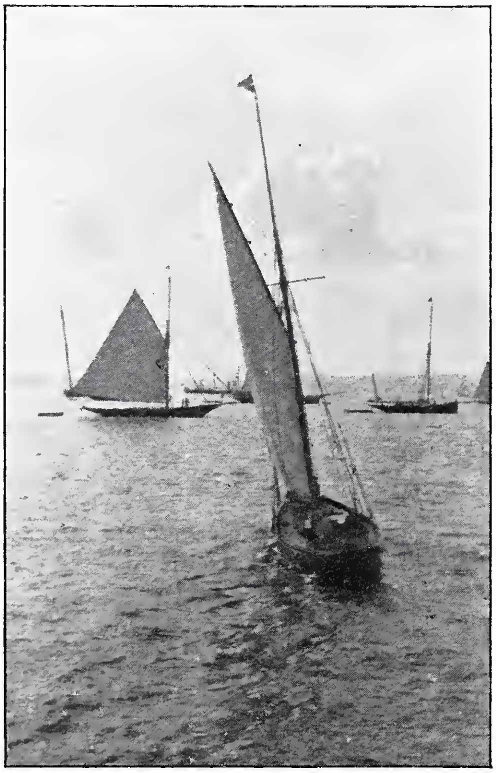
Mr. W. B. Post's picture has already received many awards. It is certainly a beautiful bit of seascape work, the only fault we can find with it lies in the blackness and want of detail in the rocks. The sky, too, has the appearance of being printed in, although we have had the original negative in our possession, and know that this is not the case. It is one of the peculiarities of photography that natural skies taken with the landscape often look far more unnatural than those that have been printed in afterward.

The winners of the three certificates were Mr. H. K. Noyes, Mr. Walter D. Welford and Mr. W. H. Dodge. Mr. H. K. Noyes' work showed good technical skill and clean manipulation, but little artistic feeling. We refer only to the pictures



OUT FOR A SAIL. H. K. NOYES.

AWAY INTO THE MISTY SHADES OF EVE. W. D. WELFORD.



RUNNING OUT. W. D. WELFORD

sent in, however, as we have seen some very artistic work by this gentleman, who is the holder of a Photographic Times bronze medal. Mr. Welford, who is a well-known English hand-camera worker, and the editor of *The Photographic Review of Reviews*, sent some charming little mat surface prints, very effective, and possessing many good qualities. We have attempted to reproduce these here, but it is only fair to Mr. Welford to state that they do not give any idea of the delicacy and beauty of the originals.

Mr. W. H. Dodge, the winner of the third certificate, sent in a very beautiful and tastefully gotten up picture entitled "Evening," which, we believe, obtained a medal at the recent Brooklyn exhibition. Owing to the color and nature of the picture, we have been unable to reproduce it.

With regard to the remainder of the work sent in we have little to say, with the exception of a few instances, a great deal of it was indifferent, and the rest bad. Many competitors have a curious idea of what constitutes a "seascape," and so long as a duckpond was visible somewhere they considered it eligible.

Ninety-nine per cent. of the work was purely the result of the camera. Some of the pictures were better than others, but this seemed in many cases to be purely a matter of accident than otherwise, the photographer having been fortunate in planting his camera in a suitable spot. What we want are pictures, not purely photographic records; we want to see some display of artistic feeling in the composition and treatment of the subject. If we could get a camera that would walk about and expose itself automatically, we believe the result would be a better lot of pictures than the majority of those sent in.

We would remind our readers that the time for the closing of our next competition is at hand; we sincerely hope to see an improvement in this, although genre work is a more difficult subject than any we have had yet. Without some display of artistic feeling the results can only be ridiculous. We want to see work that will show the camera to have been but the means to work out the idea of the photographer, and there must be nothing in the picture to make it apparent that the camera was there When there is an apparent consciousness on the part of the models of the existence of the lens the effect is invariably ruined. We will hope, therefore, that competitors will succeed in over, coming this.

THE KYLES OF BUTE. W. D. WELFORD.

Chicago Photo Engraving Co.

SUNSET, MID-OCEAN
BY E. V. CLARKSON.

ENLARGING.

BY A. R. DRESSER.

DURING the time I have followed photography for pleasure, no part of it has given me such pleasure as enlarging, as the composing the picture on the screen and moving it back and forward, up and down, until one gets it just what one as required, is quite a pleasure, to say nothing of seeing the image develop out in the developer, and so fond am I of bromide papers that I use nothing else now for printing on, in fact, it is years since I used a piece of silver paper. As I am so fond of enlarging, I take that subject as my article promised the editor of the TIMES, and hope the few hints I give may be of use to the readers of that paper, and that it may lead others to follow in my footsteps and take up enlarging and bromide printing.

In order to make everything plain I will describe the various methods of enlarging, and give my ideas on each as I go along, as each way has its great points, or otherwise, and also so much depends on whether one can afford to spend much on it, although enlarging can be done without considerable expense. The only point to bear in mind is that one, if he expects to get good results, must use a *good lens.*

Now I will go on to the various ways of enlarging and apparatus required.

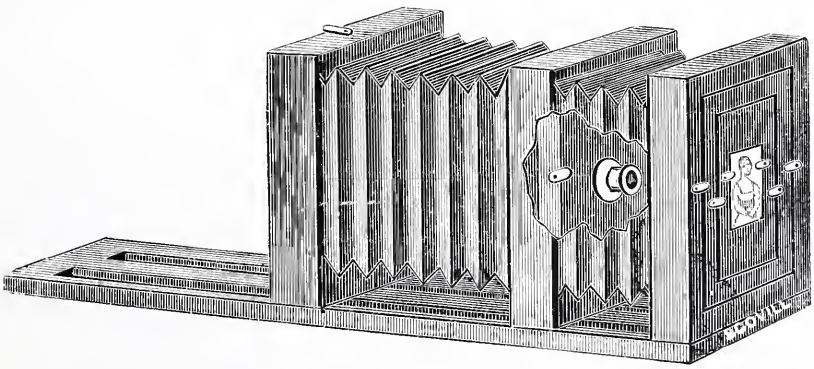


FIG I.—ENLARGING CAMERA.

Whether enlarging direct on bromide paper or making an enlarged negative, you will require an enlarging camera, and so I will describe mine, although I fancy it is well known, as I have so often given drawings of it. When enlarging this way you require a camera the size you intend to enlarge up to, but, as a rule, 8 x 10 is quite large enough to enlarge ¼-plate to, although I enlarge that size up to 15 x 12, and have a camera made specially for that, viz., an 8 x 10 camera, with 48-inch extension, and then I have a 15 x 12 camera back, with a plate-holder which slides into the back of the 8 x 10 (where the ground glass is), and the whole extends 6 feet, and I can then enlarge a ¼ up to 15 x 12 with ease. If you want to work in any ordinary room you can get a cheap deal table. (A in Fig. 2.) On the table you nail two pieces of grooved wood (BB), and then make a box that pushes backward and forward, and on this box you screw your camera (D). Your camera requires to have a long extension, say 36 inches, for enlarging to 10 x 12. Then at one end of the table you put up a carrier for your plates, which rises in two pieces of grooved wood, so that you can then raise it up or push it down as required. In the piece of wood you cut an opening for holding your nest of carriers, say from 8½ x 6½ down to ¼-plate. I have my nest of carriers on a circular piece of wood, so that you can turn it round and round, so that if your lines in the negative are not quite right you can make them so. Now all you have to

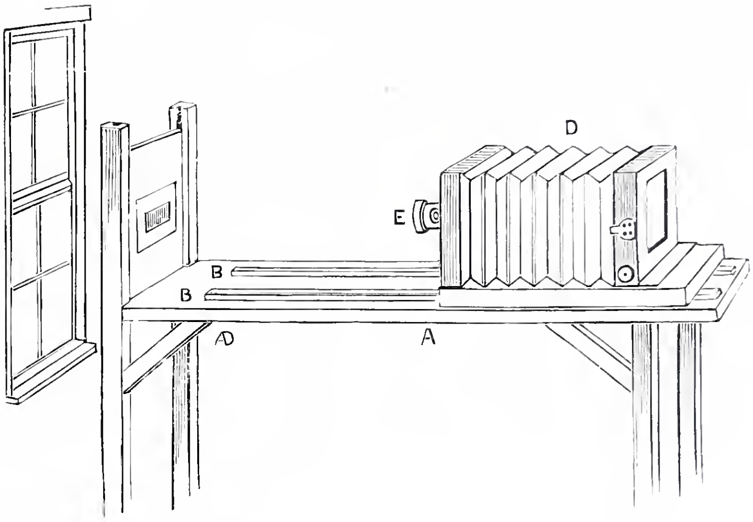


FIG. 2.

do is to place your negatives in the opening and focus to size required. Then, if you are working in an ordinary room, you face the window, put your dark cloth over the camera to exclude all light that is between the negative and the lens, and make your exposure.

If one has a large dark-room it is best to cut a hole in the wall, and in it place the frame for holding your negatives, as then you can work much easier, as you are working in a darkened room, and are handy for developing, etc.; but it is not many who have a dark-room sufficiently large, and those who have not must work in an ordinary room.

Now, having described an enlarging camera, I will go on to various ways of working.

As I said before, there are two ways of enlarging—one by making an enlarged negative, and the other by enlarging direct on bromide paper.

1.—MAKING AN ENLARGED NEGATIVE.

This is by far the longest and most costly way of enlarging, but if you require a number of prints of a large size, then it is best to make them this way, as you can then print on any sort of paper you may wish.

The way to set to work is to place the negative (¼) on the frame for negative (Fig. 2), and then copy it, and make a transparency. It is a disputed point as to which is the better method, whether to make the transparency to size required (say 10 x 12), or to make the transparency ½ or ¼-plate I prefer to make the transparency ½-plate, and for so doing use a slow plate; in fact, I have plates of all sizes coated with lantern slide emulsion, and use them for this purpose. Take great care that your negative is as free from spots as you can get it. If there are any, you must retouch them, then copy it and make a transparency ½-plate size. Give a good exposure, and use a small stop to get plenty of definition, and carry the developing well forward; mind and dust the plate before exposing. There are various ways of dodging your negatives during the exposure by vignetting parts with card-board, etc.

Now, after exposure and development, if your transparency is good, you let it dry, after well washing, and then varnish it and do any retouching or spotting it may require.

Should the subject be one that requires a sky printing in, you choose a sky negative that suits the picture, and then make a sky transparency on a different piece of glass, remembering to put *film side* of sky negative from you so as to get it reversed. Now, after the sky transparency is made and washed, you place it on the subject transparency and work on it with a reducer so as to reduce any of the sky that may overlap the foliage, etc., in the subject negative. When both positives are dry, spotted, etc., you bind them together (film to film), and then copy them up to size required (viz., 10 x 12), and in that way get an enlarged negative. When copying this way I always use a wide angle lens, as it has a greater depth of focus with a big stop (in case you want to use a large stop).

Now all depends on the care you take what sort of an enlarged negative you get, as you must remember all faults and marking in your ¼-plate negative are enlarged, and so you must obtain for this work a good negative, and take care to keep free from dirt and stain during your various exposures and developments. If you know how to work the various ways of dodging and double printing, of course you have any amount of latitude in enlarging this way, as you can double print or introduce figures, etc., etc., by a little extra work, and by careful thought.

As I stated before, there is more trouble and expense in making an enlarged negative than by enlarging on bromide direct; but there are some advantages, such as combination printing, as you can take certain parts out of any negative and make two or three positives as required, then bind them together and copy with a wide angle lens, and the negative thus obtained will be in focus.

In my previous article I described my apparatus, and gave a rough drawing. Now in Figs. 3 and 4 I give different drawings of it, viz., camera as ready for enlarging up to 8x10 (Fig. 3); you see the part used for holding the negative is slightly different, as I have arranged the holder for the negative so that it can be moved to any angle; this I find of great use when

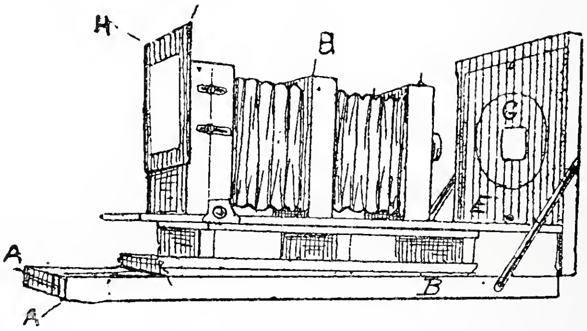


FIG. 3.

copying a negative that has not got the lines straight.

It will be observed that the general principle of Figs. 2 and 3 is the same; but the support of the camera, viz., AA, is not supplied with legs, but can be moved about and put on any table or stand; then the front (E) for holding negatives is quite different, as the part that holds the negative works round in a circle, so that you can place your negative vertical, horizontal, or at *any* angle with ease. The drawing (Fig. 5) will explain what I mean. Take a piece of wood, say, 14 inches square (A), and with a lock saw cut out a circle about 9 inches in diameter (B); then cut two pieces of sheet tin the same size as the wood, viz., 14 inches square, and cut out a circular hole of about 8 inches; now place a piece of tin each side of the wood, and screw it on wood, and then you will find the circle of wood (B) can be rotated as required. Then place a thumbscrew on each side of B at C, which will overlap the tin a little, and so that when screwed down it will hold the circle of wood (B) at any angle required. Now place a ½ plate or ¼ plate carrier on the piece of wood (B); nail it down tight, and saw out the wood so that the negative used gets all exposed, and you have a carrier for your negative that is a luxury, as you can place your negative at any angle and clamp it there. This carrier can be made altogether in wood, if desired; but I have given the instructions for making it at the minimum of expense.

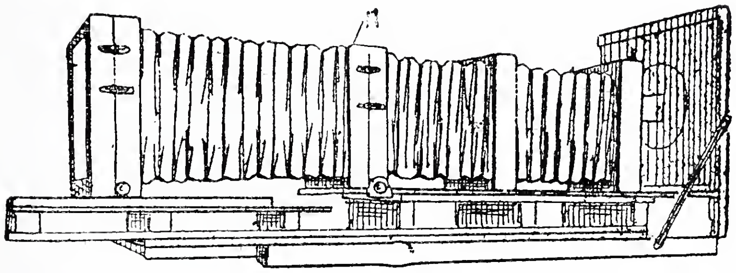


FIG. 4.

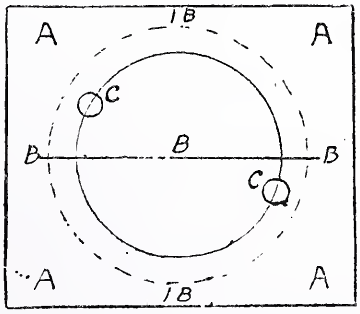


FIG 5.

If you refer back to Fig, 3, the camera which I use for enlarging, you will see it is for enlarging up to 8x10 only; but by taking out the ground glass back (H) I can place the front of an extending camera in it and enlarge up to 15x12. Fig. 4 shows the camera with extension on it, as used for enlarging up to this size; the length of focus of this camera is 6 feet 6 inches, and I can enlarge a ¼-plate up to 15x12, when using a Beck R.R. for 8x10 camera. The drawings will, however, explain what I mean. I have just had the camera and stand made to my drawings, and the cost of all was $50 or $60; and anyone who wants to go in extensively for enlarging cannot do better than indulge in one, if he can find time to work by daylight; but I do not recommend it for artificial light.

Now, having described the apparatus required, I will speak of enlarging direct on bromide paper through the camera. The work is really the same as described before, only bromide paper is used instead of glass. Take a piece of clean glass, free from scratches and marks, and put in the holder where sensitized plate ordinarily goes; then on it place a sheet of bromide paper, and over that a piece of cardboard to keep it flat. After closing the back, all is ready for exposure. By employing this means you are unable to do combination printing, but you can double print—that is, put in clouds. Of this, however, I shall speak later on. I am a great advocate for enlarging in this way. When one gets experienced, failures are rare, and, besides, double printing can be done, or any dodging or shading of the negative in parts it may require. The greatest advantage of all is that camera and stand can be worked in any ordinary room, and that the same outfit will do either for enlarging or reducing.

When enlarging, the lens is close to the plate; and if working in an ordinary room, or even out of doors, all that is necessary is to throw a dark cloth over the front to protect the lens from any stray light, and do the dodging and vignetting at the back of the negative. The exposure which will be required depends to a great extent on the negative and stop used. I enlarged ¼-plate up to 15 x 12, my window facing W., with a tin reflector (see Fig. 6) outside at an angle of 45 deg., using a Beck 8 x 10 R.R., F. 22, and fairly rapid bromide paper. I gave nine minutes, the negative being a fair one, but certainly not thin. On a fine summer day three minutes would be enough.

The next plan is enlarging by throwing the image on a screen, the same as when using an enlarging lantern. Here a dark-room is required, as one is not able to work where there is any white light. If the dark-room is a fairly large one, 8 or 10 feet in length, it is very easy to rig up an enlarging camera to work this way, and at a small cost, as almost any camera and lens can be employed; but a good portrait lens (½-plate) works best, and gives all that is required. Supposing one has a dark-room large enough to work in, it is necessary to cut a hole in the wall facing N. or W., and place a camera against it, excluding all light excepting that which comes through the lens. The drawing (Fig. 7) explains what I mean. A is a hole cut in the wall, with a camera placed against it, excluding all light, except that which comes through the lens. It can be made to fit in a groove, and the carriers for the negatives fastened in the hole in the wall (behind the camera), but whichever way the camera is fixed, allowance must be made to get at the negative, so as to put in a sky negative when one requires to double print. To do this I fix a frame of carriers in the wall, flush with the front, or nearly so, and then nail two pieces of grooved wood (AA) in Fig. 8, on which I have a board (BBBB), to which is fastened my camera (C) in a manner that it will not move. The board holding the camera moves up and down, so I can, by lifting the board up, fasten it on a nail with a piece of string, and can then readily get at my negative D, and when the board is let down again—if it is made square—all will be in register. So that for printing on sky, after focusing, I take the view negative out, put in a sky one, give the required exposure, then lift up the board the camera is on, take out sky negative. replace with view negative, and give the exposure required. The manner I prevent light getting on the paper I will explain when I come to that part of the enlarging apparatus.

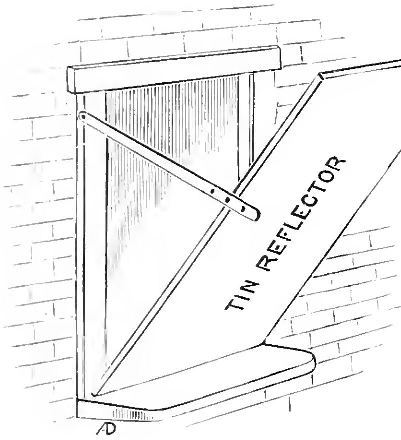


Fig. 6.

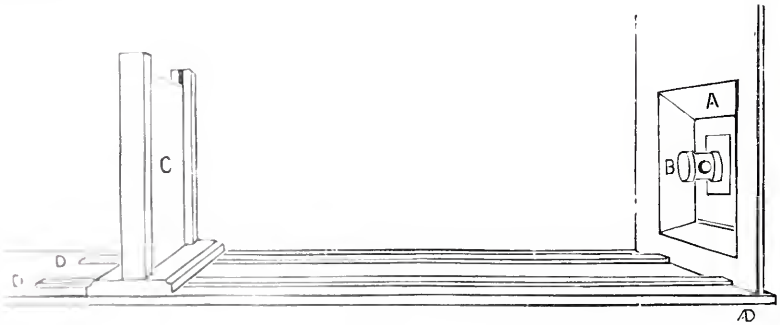


Fig. 7.

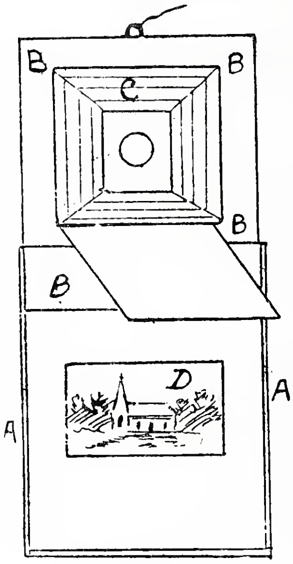


Fig. 8.

To return to Fig. 7. Procure a long board or table, with grooved pieces of wood, on which is an easel or board to throw the enlargement on (see B, Fig. 7). Now, here there are various ways of working. One can use a frame, as shown in the drawing, to pin the paper upon, or else an easel, as sold at the various photo dealers, but if so you are *unable* to do double printing, and it is this point I referred to above when I said I would explain how I kept the light from getting to the bromide paper. I have an easel that can be moved back and forward to do the focusing on, on which I have fastened the back of a 15 x 12 camera—that is to say, the part that holds the ground-glass and the dark-slide—so all one has to do is to buy any old camera at auction, the size required to work up to, viz., 8 x 10, 10 x 12, or 15 x 12, and use the dark-slides and ground-glass for putting on the easel as shown. The great advantages of so doing will be apparent, and the cost is next to nothing, for if one watches his chance he can buy the back part of a camera with a plate holder for a few dollars. Focusing can then be done much better, as it is done on the ground-glass; you are not bothered with pins to pin your paper on a board, and you have not to work in the dark; and, lastly, you are able to double print without fogging your paper. When the sky negative has been exposed put in the slide of the holder before drawing up the camera to replace the view negative. Those who pin their bromide paper on the easel, must make a cap with a piece of thin yellow glass in to use in place of the ordinary cap, which will enable them to see exactly where to pin the paper.

Now, having described the camera, etc., for enlarging by daylight, I will proceed to give the way of doing so by artificial light.

The best method to employ is to buy an enlarging lantern from some good maker. Of course, when one is enlarging from ¼ or 5 x 4 plates, only a lantern is just the thing to use; but, when enlarging from ½-plate and over, it is by far the best to use daylight, as described before. Or, if one is using an enlarging camera, as given in Figs. 3 and 4, it is easy to rig up an apparatus for inexpensively enlarging by artificial light, as all one has to do is to buy a 6-inch condenser and fit it in a box with light behind it, and copy as if using daylight.

There is no need to describe an ordinary enlarging lantern, as one can be seen and tried at any photographic dealer's. The only point is what to use for your light for so doing. Oil lamps I gave up long ago as of little use; the best to use is the lime light for ordinary workers, but it comes costly. For the last year or two I have used the incandescent gas-light for my enlarging (and magic lantern work), and find it works by far the best, as it is cheap, always ready for use, as one only has to strike a match and light it, and he can go to work enlarging at once. The only fault that can be found with this light is that the mantels are badly made and not to be depended upon, and, of course, it can only be used in a house where gas is laid in; also, I am not sure if said light is to be got in the U. S. A. I gave a description of how to work it in last year's year book.

Having described the apparatus, it will be necessary to describe how to do the enlarging, developing, etc., etc. The making of enlarged negatives I shall not go into, as few amateurs care to go to the trouble and expense of making enlarged negatives, when one can enlarge direct to size required on bromide papers, and now that bromide papers are so good one can require no better results than can be obtained by so doing.

I am a great advocate for bromide paper, and use it for all my work, both contact printing and enlarging. In enlarging one must learn how to dodge his negatives and do double printing, so as to put in a sky when required. But that I shall touch on later. One point must be remembered in enlarging on bromide paper, and that is to get hold of a good brand of paper and stick to it, as you will then soon be able to be sure of your exposures, as if one tries one brand one day and another the day after, and so on, he will never succeed in doing good work, as all brands differ in their rapidity and working. The same remarks apply to the developer.

Having decided on what brand of paper you will use, the next point is what developer to use. I will give the formulæ of the ones I have used, and my readers must take one they like best and stick to it.

Developers.—First the iron developer, which so many swear by. I have given it up long ago, as I disliked the risk of having iron left in the paper, and as I found I could get as good results, if not better, with other developers, I gave up the use of it, but give a good formula for those who like this developer :

(1) Make a saturated solution of oxalate potash and make it acid with acetic or hydrochloric acid.

(2.) A saturated solution of iron, also acidified with the same acid.

(3.) Make 10 per cent. solution of bromide : for use take No. 1, 4 ounces, No 2, 1 ounce, and No. 3, 3 to 5 drops. After development, before *washing*, rinse two or three times with an acid solution of water, 30 ounces : acetic acid, 1½ drachms.

Of the other developers that are good for developing bromide papers, etc., I can speak well of eikonogen, metol and amidol. Hydroquinone I do not care for.

Eikonogen works very well in my hands with the following formulæ :

No. 1.

Eikonogen	1 ounce
Sulphite of soda	3 ounces
Water	60 ounces

Dissolve by boiling in, say, 10 ounces of water, and then make up to 60 ounces.

No. 2.

Carbonate of soda or washing soda	3 ounces
Water	20 ounces

For use, mix 3 parts of No. 1 with 1 part of No. 2, with 2 to 3 drops of 10 per cent. bromide per ounce.

Or, if wanted in one solution:

Eikonogen	2 ounces
Sulphite of soda	6 ounces

Mix as before in boiling water.

Carbonate of soda	2 ounces
Carbonate of potash	1 ounce
Water	90 ounces

Use full strength for under exposure, or with equal quantity of water for over.

Metol I use as per formulæ sent out by the makers (Metol Hauff).

The last developer is amidol, the one I like best and by which I can get the best results on any bromide paper, or plate. I am very pleased with amidol, for the last year it has been the only developer I have used for all my work, either negatives, bromide papers, or lantern slides. The formulæ sent out by the makers does very well, but I prefer my own; it is much stronger than one sent out by them, but I get extra fine blacks on bromides when using a strong developer and therefore use it. I strongly advise a good trial of amidol as I am sure it is one of the best developers to be got, and only wants knowing to be liked by one and all. I speak well of amidol as I find I get such good results with it.

Formula for Amidol.

No. 1. A saturated solution of sulphite soda (I make up from 90 ounces to 180 ounces at a time.)

No. 2. A bottle of amidol (dry and in powder).

No. 3. Ten per cent. bromide.

No. 4. Five per cent. carbonate potass.

(1, 3 and 4 of above will keep when mixed for all time.)

For use, I take, say,

No. 1.

Sat. sol. sulphite	4 ounces

No. 2.

Amidol	24 grains

No. 3.

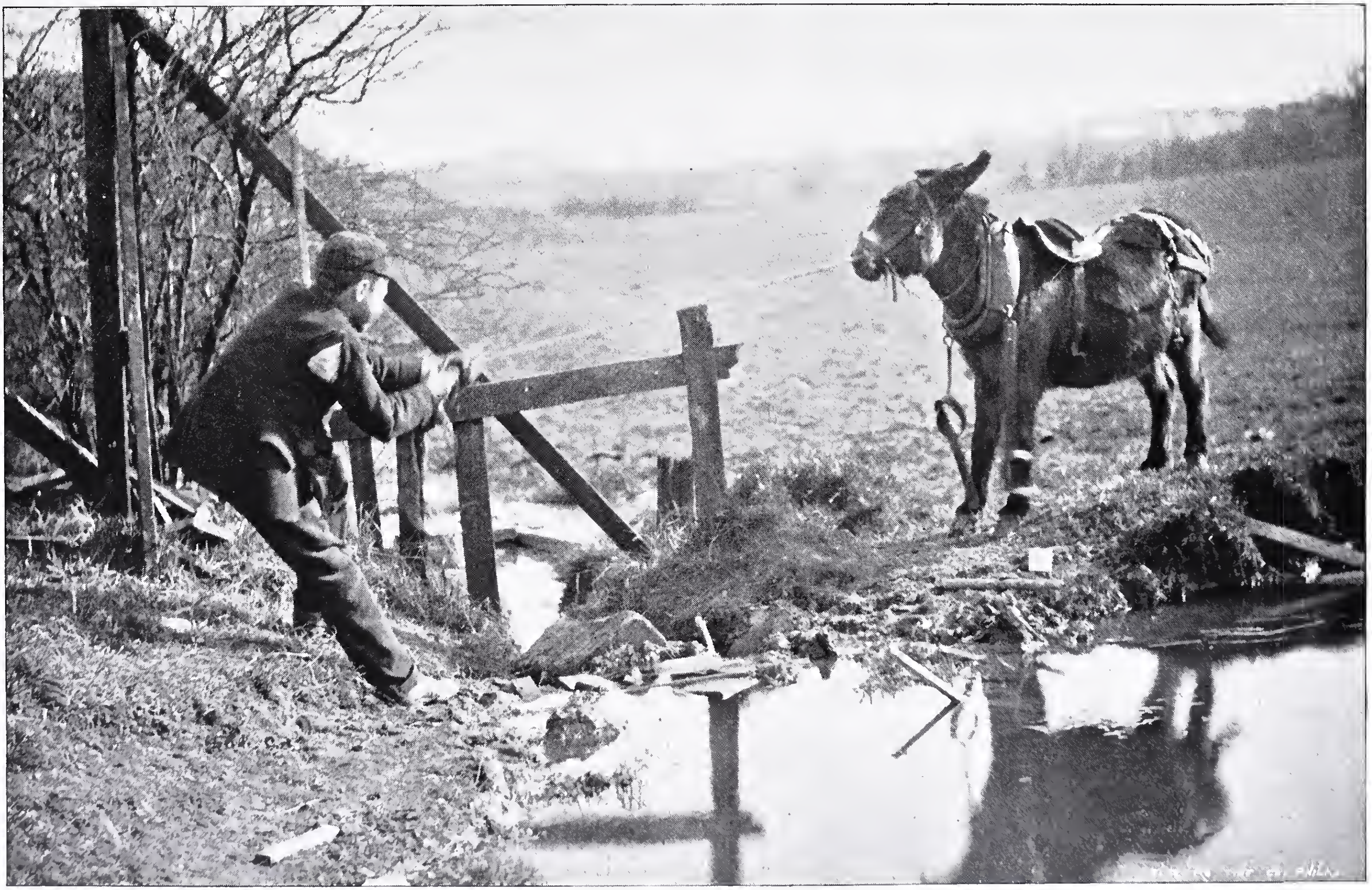
Ten per cent. bromide	90 drops

and use it full strength for bromide papers; in case of a known over-exposure one can dilute with equal part of water or add more bromide. I think it best to use bromide, for as soon as one dilutes the developer, one gets the tones "gray." This developer, when mixed fresh, can be used for three or four sheets of paper, without loss of color.

Where you have a very dense negative that requires a very long exposure, it is then as well to be sure of giving exposure enough and diluting the developer with equal quantities of water, but I seldom find it necessary and prefer to use developer full strength and so keep my black tones. In cases where one wants to get red tones by after-toning with uranium, then it is best to dilute the developer and rather over-expose, so as to get a grayish color, but that will come under heading of different tones on bromides.

* * *

STORM IN NEW ROCHELLE HARBOR. BY E. B. TOFT.



Electro Tint Engraving Co.

"WHERE THERE'S A WILL THERE'S NO WAY"
BY CHAS. REID.

JOHN A. HODGES AND HIS WORK.

JOHN A. HODGES dates his connection with photography back to the pre-gelatine era, when the collodion process was at the zenith of its popularity. His practical acquaintance with various processes which have now become almost obsolete, serves him in good stead for his lantern-slide work, to which branch of the art he devotes a considerable portion of his time. Although by profession a stenographer, and a member of the Institute of Short Hand Writers, England, he has a passionate love for the art-science, devoting every spare moment either to practical or experimental work. He has been for several years past a prolific writer upon photographic topics, he is a constant contributor to the *Amateur Photographer*, and to other English photographic journals. He has also published several text-books, the more important being the "Lantern-Slide Manual," "Practical Enlarging," a second and enlarged edition of which is about to appear, "Elementary Photography," and "Photographic Lenses," all of which have been very favorably received by the general and photographic press.

Mr. Hodges is a firm believer in the utility of photographic societies, and for the last two years has held the office of President of the West London Photographic Society, one of the most influential of the London suburban societies.

JOHN A. HODGES.

Being a great lover of the picturesque in nature his attention has been devoted more particularly to landscape work. He is familiar with all the finest scenery in his native country, but has, so far, never wandered from its shores, and possesses a very complete series of negatives of Wales, Devonshire, The Lakes, and the Isle of Wight. As we have said, he is *facile princeps* in the art of lantern-slide making, and possesses some very fine lecture sets, illustrative of the scenery of the above districts. He is well known as a lecturer, and his services in that capacity are in great demand during the winter months. When out on tour he prefers to take a small camera, preferably a 5 x 4, but always carries a battery of lenses of varying focal length. He prefers the American plate-holders to the English double backs, and always uses the former. Through his courtesy we are enabled to reproduce one or two of his pictures. "Softly Falls the Evening Light," although of small dimensions, has received distinction at several competitions. Although at one time a regular exhibitor at most of the more important exhibi-

John A. Hodges.

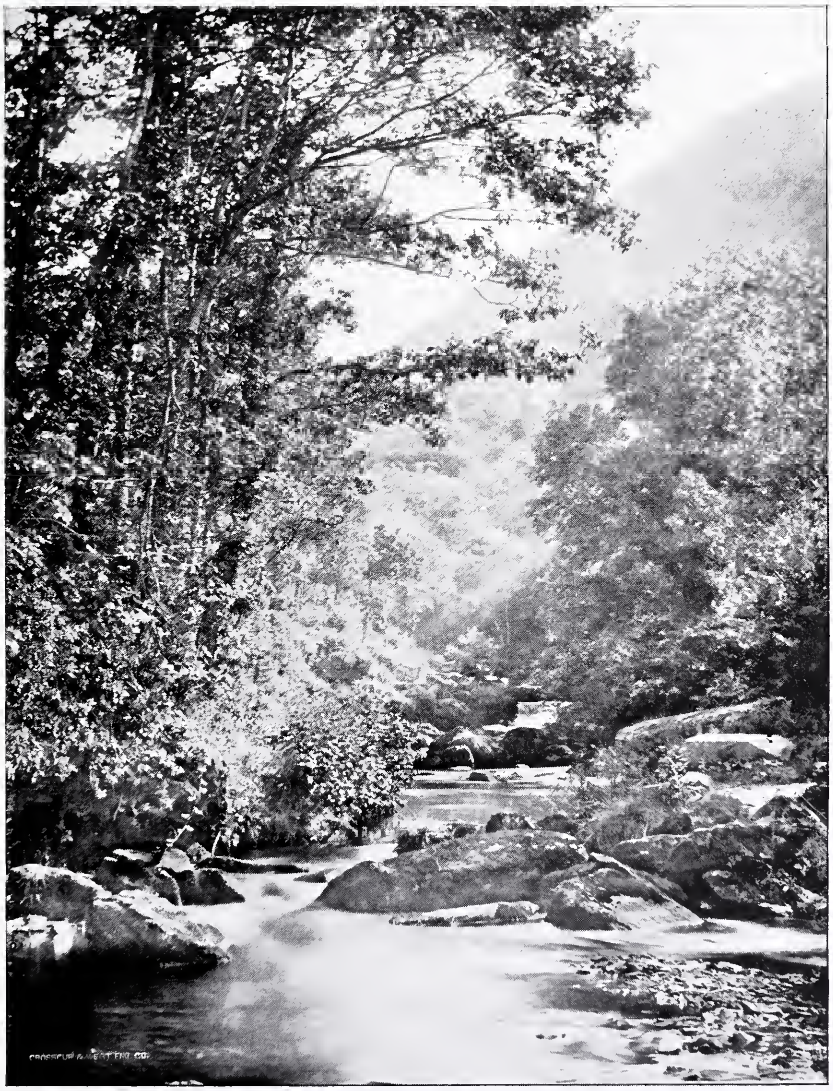
THE OLD MILL.

tions, Mr. Hodges does not now very often exhibit.

He holds a very large number of medals, both silver and bronze. "Rockford," North Devon, is a charming example of English glen scenery, a class of subject to which he has given much attention. "Near Brendon" is another beautiful glen view. Curiously enough the celebrated painter, Mr. Yeend King, chose precisely the same view point for one of his large landscapes, last year, a flattering testimony to Mr. Hodges' artistic perception. "Lynmouth" is a view well known to lovers of Devon scenery. "The Old Mill" is one of those delightful studies which, now that steam is largely replacing water power, are rapidly becoming rare. Mr. Hodges tells us that he secured the effect of falling water by first giving a time exposure for the general view, with the wheel at rest, and then a shutter exposure on the same plate for the moving wheel and falling water. "Bleak December" was admitted to last year's Salon and received very favorable press notices. "A Kindly Office" and "Strand on the Green" are two small studies not calling for particular mention. Mr. Hodges, we understand, has lately joined the staff of the "practical photographer." He is not a supporter of the "fuzzy school" methods but is emphatically of opinion that breadth and atmosphere can be secured in a photograph without resorting to any of the tricks and methods advocated by others. At the same time he decrys the use of small stops, and consequent wiry definition, and prefers for general landscape work to use an aperture of about $f/11$.

By John A. Hodges.

STRAND ON THE GREEN.



NEAR BRENDON ON THE EAST LYN.

Judging from the work that we are constantly receiving, a large number of the amateur photographers in this country might learn a lesson from this that would be of value to them. We have the intention in an early number to deal with this subject, "the abuse of stops in landscape work," so will say but little here, merely confining ourselves to the remark that the diaphragm or stop plays an important part in the formation of the image, a fact which few seem to recognize. More than 90 per cent. of the pictures which we receive are made with too small an aperture, and, consequently, are flat, devoid of aerial perspective, and lacking in stereoscopicity.

By John A. Hodges.

SOFTLY FALLS THE EVENING LIGHT.

The pictures which we reproduce here do not do full justice to Mr. Hodges. The beautiful delicacy and softness of the originals are lost in the half-tone reproductions, and this is unfortunately nearly always the case with cuts reproduced from mat or rough surface prints.

We hope to be able to induce Mr. Hodges to send us some more of his work for the benefit of our readers.

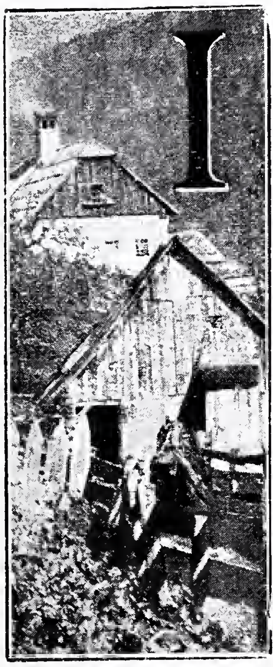
Besides possessing considerable artistic taste and feeling, which is evident in his work, Mr. Hodges is a thoroughly practical man. His work is technically perfect, and he has taught many a valuable lesson to the members of the society of which he is the honored president.

* * *

ROCKFORD, NORTH DEVON. BY JOHN A. HODGES.

DEVELOPERS IN EUROPE.

BY ANDREW PRINGLE.



It may fairly be said that no factor in photography is at once more important and more interesting than development; and the general history of the craft may be said to run in a great measure parallel with the history of development. It would be more than rash, it would be false, to affirm that any violent revolution has taken place here within the last few years in development, but it is certain that some new reagents are gradually but surely creeping into favor, and it follows that to some extent the average quality of negatives is changing with the change of reagent. There is no doubt that alkaline pyro still stands well ahead of other developers in estimation and in use, for we are a conservative lot, and we are very careful to avoid change, with its uncertainties and difficulties, till we are very well assured that something definite and appreciable is to be gained by change. It seems the American character is more apt to experiment, more addicted to change for its own sake; so probably the newer developers are more in vogue with you than they are here, but no harm will be done by my giving some idea how the matter stands with us.

In the first place, I think that for all-round work, for every class of subject and result, pyro, as a developer, has not yet been beaten; but I am no less satisfied that for certain specific purposes some of the new reagents are, if not superior to, at least more convenient than, our good old friend. In America, as is well known, ammonia is not nearly so much used with pyro as the carbonates, and the reason is not hard to find; but it is by no means easy to say which finds greater favor; what is pretty certain is that the carbonates are being gradually more and more used Hydroquinone never really got a firm hold here for general negative work, though for some purposes, as where dense black and white negatives are required, it is used to a considerable extent. *Eikonogen* and *rodinal* had their day among amateurs, but, so far as I know, never were anything like generally adopted by professional men, and a developer at which the latter look askance can never be said to be in general use. *Amidol* followed, and, without doubt, this substance found much acceptance, not only with amateurs, but with all classes, and, indeed, the use of this reagent is still on the increase. There is not a doubt that amidol is a very fine developer, provided there is no condition tending to difficulty in getting density; this is not to say that density cannot be got with amidol; I mean that the danger in its use is that density *may* not be got. But when proper steps in exposure have been taken, and a suitable solution of the substance used, the negatives are of the greatest beauty and printing excellence. For rapid work it answers every purpose, and its merits for bromide paper work shall be touched on later. One thing may safely be asserted; the introduction of amidol helped to bring about a marked improvement in hand-camera work, an improvement which was very much wanted. I doubt whether professionals have taken really kindly to amidol in this country, though negatives produced by it ought to be popular with them. With a briefer exposure than pyro will allow, better printing negatives are obtained; but I do not believe that for merely "bringing out" details, amidol, or metol, or any of the new developers, is superior to pyro. The point rather is that when any "forcing" is required to bring up detail, the pyro negative is likely to be spoiled for printing, while the amidol negative will not, because it does not pile up so much density on the high-lights as alkaline pyro in such a case.

Amidol was closely followed by *metol*, and this developing reagent has in my opinion the good qualities of amidol, and also of pyro, without the faults of either. Like amidol it admits of shorter exposure than pyro, but with metol there is less danger than with amidol of failure to obtain density. It is always, and rightly, contended that pyro is a very elastic developer; errors of exposure can be minimized in the result by modifications which are simple and well understood. According to my experience it is quite difficult to rectify exposure-errors, speaking, of course, comparatively, with amidol; but I find metol almost, if not quite, as amenable to handling as pyro. Soluble bromide in the developer has a marked effect, and the alkali can be added in small and gradual quantity. I have published experiences of "tentative" developing with metol which I have not beaten even with pyro. Beginning with metol and sodium sulphite alone, I have, by gradual addition of carbonate, worked negatives to any point of density and detail that could be desired. In this and similar ways I have developed successfully large numbers of plates exposed under most various conditions, not only by myself, but by others not nearly so experienced. Like amidol, metol gives the very quality of negative that seems desirable for portraiture, while for hand camera work I distinctly prefer it to all developers, because, among other things, it is easy to get density even if the exposure has erred considerable in either direction.

In solution with sodium sulphite, metol keeps for a very long time without any noticeable falling off in its performance; my normal solution is a 1 per cent. in a 3 per cent. solution of the sulphite. A normal developing solution will consist of 3 parts of this to 1 of a 10 per cent. solution of potassium carbonate with 1 grain of potassium bromide to each ounce of developer. This bromide may be omitted without fear of fog, and for delicate negatives the proportion of alkali may be lowered, or water may be added to the above solution.

A new and very remarkable reagent is *glycin*, and with no one has it found favor more than with your countryman, Mr. W. J. Stillman. It is certainly less easy to make bad negatives with this developer than with any other; development with it becomes little more than a question of time. If the exposure has been minimal, but still not grossly short of the necessary to impress the plate, glycin allowed to act for a long time will effect at least as much as any other agent. If the plate has been seriously over-exposed, we only require the developer to act till density is gained, for the production seems to be contrary to the nature of glycin. If exposure has been normal the developer acts in the normal way and time, or possibly somewhat more slowly than other classical developers. It keeps in solution for a very long time, and the only caution apparently needed is that some plates, from the nature of their film, may frill on account of very long continued action of the alkali used with the glycin. At least I have lost plates in this way when I was experimenting in the direction of protracted development. As might be expected, this agent is well suited in most respects for lantern slide development; but I must say that I do not wholly like the tone produced on gelatine-bromide plates by glycin. But where tone is not of great consequence, or where steps are taken to improve the tone, glycin may safely be recommended for trial. It is, however, to be confessed that I have not made any experiments with a view to amend the tone in glycin development.

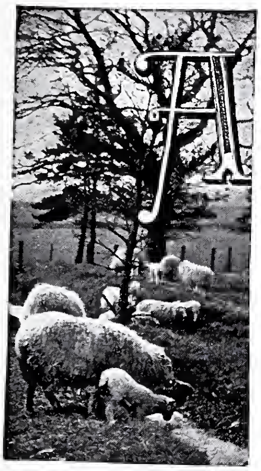
Good lantern slides may be made with amidol or metol, but I cannot say that these substances, or glycin, are superior to pyro, or hydroquinone, or ferrous oxalate, for this purpose. Amidol seems to have a slight tendency to fog; metol and glycin do not give the tone wanted. In any case it is a mistake to reduce the proportion of these substances in the developer; it is better to keep up the strength, and to restrain powerfully with bromide.

I have tried all these new reagents for bromide paper printing, always keeping in mind the excellent results obtained with iron. I never expected to find any developer to beat ferrous oxalate for this work, but amidol upset my calculations. With amidol we get results certainly as good in the matter of tone as with iron, and that with less exposure, equal certainty, and shorter development. In fact, ferrous oxalate is now banished from my laboratory, except for purely experimental work. The amidol is to be kept up in strength, but about two grains of bromide should be added to each ounce of developer. It is within my knowledge that amidol is now very largely used for bromide printing in this country by those who make a trade of this kind of work, and surely no persons are better qualified to judge of what is best.

I am convinced that many British readers would be glad to know how the matter of developers stands "over the way"; at any rate I can name one who would be so.

AN EVENING WITH THE DIATOMS.

BY HON. A. A. ADEE, A.M.



AS a result of the paper which I incautiously contributed to this winter's "Photographic Times Annual" on the subject of simplified micro-photography, my good friend the editor has, in use of the editorio-regal prerogative, commanded a contribution on such new phases of my work as an additional half-year's experiment may have developed, and I, as a loyal and true subject of the enchanted realm of Actinia, hasten to obey the mandate.

An evening with the diatoms demands a decided advance beyond the simple stage of direct microscopic projection by a low-power objective alone without the aid of a projection eye-piece, if we are to discern somewhat of the marvelous intricacy of structure and delicacy of adornment which especially mark the 30,000 or more diatoms that have made the life study of many eminent researchers. For, as they display endless surface curves, scooped out here and shallowing off there in endless gracefulness, direct projection by means of a high-power objective brings only little patches of their exquisite markings into view, and their general form and design are lost. With the more ornamental species, a quarter-inch, or at most a fifth, is the highest power that will show the contour, and an amplifying eye-piece is needed to give satisfactory pictures to the eye.

Here, again, complications arise, for an ordinary quarter-inch glass that will give pleasing, direct results breaks down visibly when an amplifier of fourfold power is applied. Only the best objectives can be employed, like the costly apochromats of Zeiss or the first-class series of reputable makers of finely corrected achromatic lenses, such as Powell and Lealand, Bausch and Lomb, or Ross. The eye-piece itself is of special construction, designed to counteract the spherical aberration which the extreme wide-angle objectives show up on the focusing-glass, and to give a flat view, sharp to the edges of the circle. To these must be added an achromatic sub-stage condenser of the Abbe pattern, 1.00 numerical aperture, the manipulation of which as to focus centreage and volume of light is a study to tax the expert. The source of light, too, is most important to a creditable result. The ideal illuminant is an intensely brilliant point, like that of a well-adjusted carbon arc, or an incandescent disc of small area, such as the German Zirconlicht. In default of these, good work can be done by screening off all but a third of an inch of the edge of a broad wick kerosene flame and making its rays parallel by a bull's-eye; which, by the way, should be achromatic, or, at least, of the aplanatic variety as now sold in London. I use a Welsbach gas burner because of the clear whiteness of the glowing mantle, which materially shortens the exposures, and I get the much-desired luminous disc by interposing a perforated metal screen within the chimney almost in contact with the brightest area of the luminous mesh. Although emitting less heat than a lamp, its concentrated rays would melt the balsam in which most objects are mounted, and, moreover, warm and unequally expand the metal of the microscope stand so as to materially alter the focus, during the long exposures of from two to five minutes that are necessary with the higher powers, were not a glass filter cell set in its path. I use several of these cells, filled with liquids of different colors and densities, yellow, orange, yellow-green and pure blue, according to the subject, the tinge of which may give little contrast, except with a screen of the complementary color. And contrast is not an easy thing to get with most diatoms. Their silicious valves are crystal-clear, and viewing their markings by direct transmitted light is much like looking through a cut-glass almond-dish held up to a window; in fact, it is worse, for a diatom is often a hollow shell, each wall of which may be exquisitely embossed and engraven on both sides so that distinct patterns blend through its transparent substance. Some species, indeed, exhibit splendid iridescence under a low power of limited aperture, but the rainbow tints disappear under an apochromat of high power and wide aperture. Pale orange-yellow and yellowish green screens are the most serviceable for general use with a white illuminant; with the yellow light of a kerosene lamp pale blue is about the best. It stands to reason that isochromatic or orthochromatic plates must be used, unless one wants to walk the floor for half an hour while an orange-screened object is cooking. The chromatic correction of the objective is a factor, also, in choosing the screen, a blue-corrected glass needing a greenish-blue screen, while a reddish or greenish-red correction calls for a more orange-hued filter. Fortunately, the beautiful blue of copper nitrate and the gorgeous yellow of chromic acid or potassium bichromate afford the means of blending any desired shade, but this sort of work has to be done by daylight.

Assuming that the illuminant, bull's eye, screen, and a chromatic condenser are all in perfect order, free from dust and in perfect alignment so that the rim of the top of the draw-tube throws a clear circle of light on the exact centre of the focusing glass (if it is too large and floods the whole surface a pin-hole cap on the draw-tube will give due centreage), the next step is to choose a good object. I happen to possess a singularly fine slide, obtained from Watson, of London, showing a group of a hundred or two of the larger diatoms found in the fossil earth beds of St. Peter, Hungary. It is a wonderful example of the high pitch to which manual dexterity is carried by the patient Germans. These tiny atoms, millions of which can be heaped in a teaspoon, are cleaned, sorted into species and varieties, and examined one by one under a strong objective so that the most perfect specimens can be culled out. These are transferred singly, with the tip of a split hair for forceps, to the slide and symmetrically arranged on their bed of balsam or styrax until some two hundred specimens, representing forty or fifty species, are grouped in a circle of an eighth of an inch in diameter. It is quite impossible to realize the nicety of this workmanship without actually seeing it under a fine glass, but the next best thing is to take a view of it, as I proceed to do. No eye-piece is required, as we only need an amplification of some twenty-five diameters, so we take a low power objective in this case, and for a camera draw of thirty-four inches, a so-called one and a half lens will do—it is really a trifle less than one and a one-quarter focus. No sub-stage condenser is necessary for this low magnification. The clear water heat-filter is found to best chime with the lens-correction, aud repeated trials end in adopting a plain iris aperture of about a third of an inch on the sub-stage, giving good contrast and a well-defined field, flat to the edges. Leaving it for a while to load the plate-holder, we find on returning that it holds focus perfectly, a most important item in microphotography. Sixty seconds' exposure with a slow landscape plate affords the result which the editor has kindly reproduced by the gelatine process as Fig. No. 1. Small as the individual diatoms are, an expert can instantly name every species, from the portly Coscinodiscus near the middle to the lovely sixteen-rayed Heliopelta or Sun-shield, than which no more equisitely orieled diatom is known.

A larger view of a portion of this bewildering circlet is next in order, say on a scale of 110 diameters. A three-quarters objective is substituted by a turn of the revolving nose-piece and a Nachet projection eye-piece is slipped into the end of the draw-tube. On getting the focus we find that this lens will stand a larger diaphragm opening, somewhat more than half an inch, and even yet the field of light is dim, for the eye-piece uses up a deal of light. We try to better matters by putting in the sub-stage Abbe condenser, but the sharpness goes off at the edges—the objective cannot assimilate the large angular cone thrown by the achromatic Abbe, and a fit of actinic indigestion results. Reverting to the direct bull's eye illumination, although a one-inch objective mounted as a sub-stage condenser would be better, three fine examples of Triceratium are brought into the central field by proper movements of the mechanical stage, a careful focus obtained on their honeycombings, and 35 seconds' exposure given at a venture, the yellow-green screen being used. This happens to be just right, as Fig. 2 testifies.

There is an odd peculiarity about this same Triceratium. To live up to its name it ought always to limit itself to three horns, but it often perversely indulges in four, like an inveterate toper, who don't know when he has enough. Those of St. Peter are tolerably well regulated in this regard, and no four horns appear among them It so happens that the prettiest and most intricate patterns are displayed by the less sober varieties, and one of these will make a tempting subject for the next essay. We turn to a Möller type-slide, another painful illustration of industrious success in the smallest of small ways, having four hundred different species of perfect diatoms classified in 24 rows and duly catalogued. Such slides are precious,

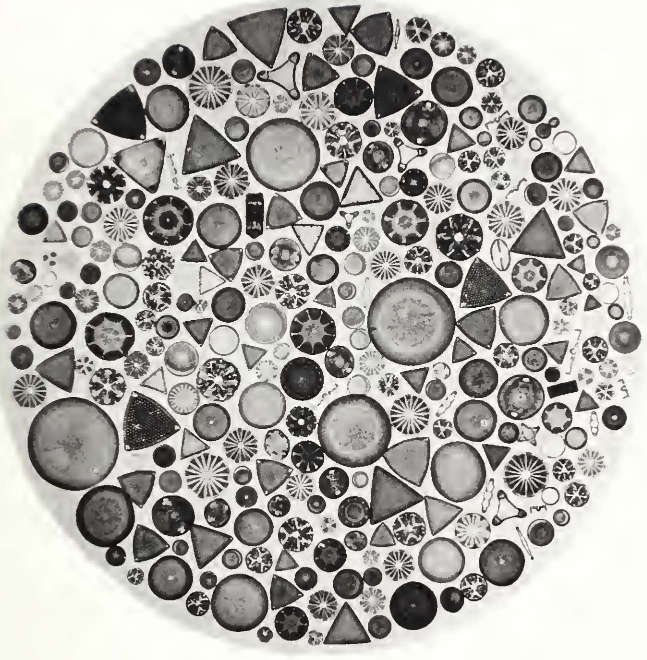


Fig. 1.
Circular Group of Diatoms.
x 26.

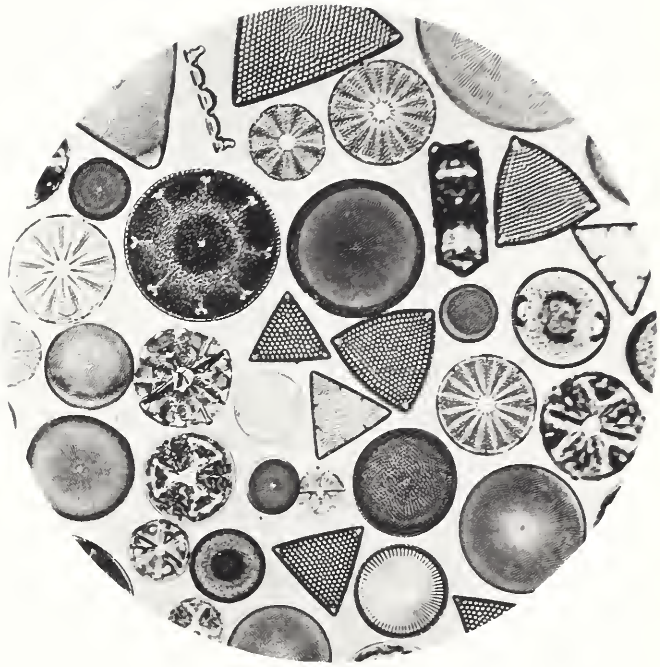


Fig. 2.
Part of Figure 1.
x 110.

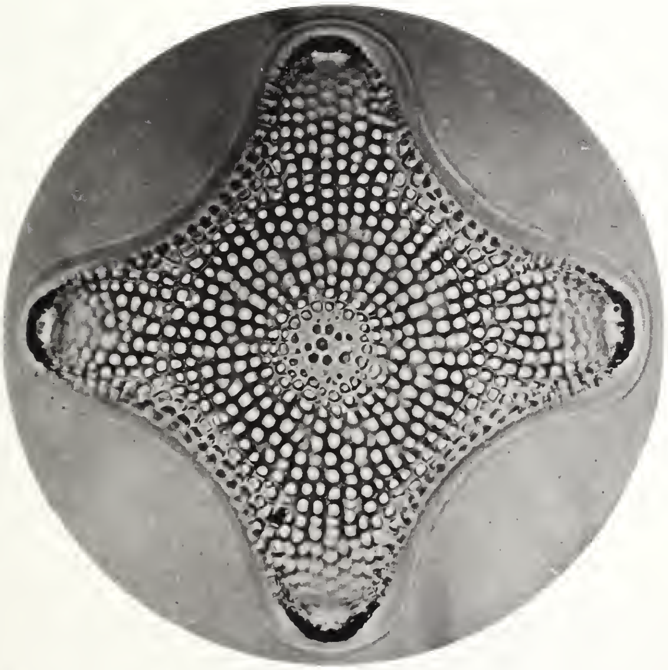


Fig. 3.
Triceratium antediluvianum.
x 550.

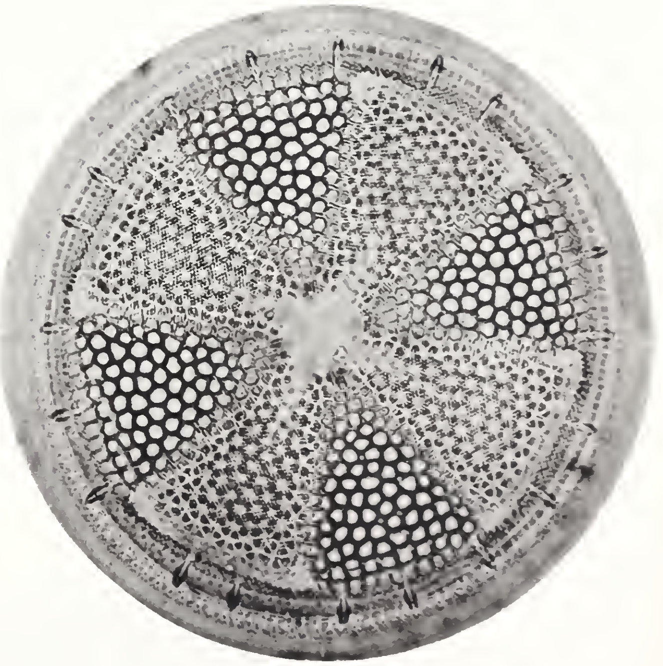


Fig. 4.
Heliopelta Undulata
x 465

DIATOMS.

FROM PHOTOGRAPHS BY HON. ALVEY A. ADEE.

See Article "An evening with Diatoms."

THE F. GUTEKUNST CO., PHILA.

even in the sight of the low-paid Teutonic artisan, costing about twenty dollars in Holstein. If I had the patience to make one, I would ask at least a thousand. Running over the lines, an especially attractive specimen turns up with the simple name of Triceratium antediluvianum. Transferring the slide from the search-microscope on a neighboring table to the photographic stand, the chosen subject is found again with a low power lens and centred on the focusing glass. But it looks dreadfully small, showing up less than half an inch across. A short mental computation suggests that it requires about 550 diameters, to obtain which I insert a Zeiss Projection Eye-piece No. 4 in place of the Nachet, and swing the nose-piece to bring a Bausch and Lomb one-quarter into play. It is in fact nearly a one-fifth, but so much the better. It is an old habit of the English and American makers to turn out lenses of a higher power than the inscription indicates, and some allowance must be made for this. Zeiss's are closely true to their titles, so far as I have seen, when tested by the stage micrometer.

A look at the ground-glass shows blank darkness. Objective and projector have used up all the light a simple Welsbach can give, and the Abbe condenser must be shoved in. It gives a glare without details, the iris having been inadvertently left wide open. Reducing it to less than half an inch aperture and getting a better focus, a dream of beauty starts into view. Three or four color screens are tried, and the pale orange-yellow chosen as giving the best contrast. The sub-stage condenser is next focused by setting a bit of fine wire gauze, 100 meshes to the inch, against the face of the bull's-eye, and racking the sub-stage until the cross-bars stand out sharp against the focused object. Then the collar correction of the objective must be looked after, and a quarter of an hour is consumed in adjusting it to yield the best definition, which I find corresponds in this case to a cover-thickness of 17½ millimeters. Meanwhile my friend, to whose entertainment I am devoting the evening, lights a cigar and potters about. He calls my attention to a pretty phenomenon and shows the angle of the condenser-ray by blowing a whiff of smoke across its path and making a momentary cone of dazzling light. I make a note of this for future occasion, and go ahead. At last all is ready, and four minutes' exposure given. What we brought out in the dark-room appears as Fig. No. 3.

My friend is much interested in the Heliopelta, and wants to know all about it. I tell him that the genus comprises species having as few as six rays, and that these rays are due to the undulating surface, the fluted hollows running out from the centre and producing the effect of rays because only the ridges or the spaces between can be brought into exact focus. At least, we think it's so—but what we don't know about these perplexing diatoms and their structure would fill a larger volume than any of us are likely to write. This peculiarity of the Heliopelta enables us to get a dozen photographs of the same specimen, no two exactly alike in detail, and none probably showing the real intimate structure. My friend says: "It's a funny little bug, isn't it?" I grimly ignore him, and complete the adjustments in silence. Doesn't he know that a diatom does not belong to the Hemiptera, but to the vegetable kingdom?

More time is taken up in settling upon the dark-green color-screen and in substituting and adjusting the weaker Nachet eye-piece, the Zeiss being too strong for the size of the object. I produce several different patterns on the Heliopelta's disc—the one I chose has only eight rays and is called "undulata"—by opening and closing the iris diaphragm, and wonder which of them is the real thing. Setting the aperture at 3/10ths, I give seven minutes and develop out the picture shown as Fig. 4.

My friend looks at his watch and says: "Bless my soul! It's half-past twelve! Time to stop." I concur, and stop.

A NOVEL FILM STRETCHER.

BY AUG. CHR. KITZ.

EVERYBODY who has worked with films, and especially roll films, will surely have sought for a suitable appliance to facilitate the handling of them.

Although these films are now less liable to curl than they used to be, their treatment still requires considerable attention.

The use of films—the stiff ones included—demands more care than the glass plate; this difficulty is especially felt by amateurs, and is no doubt the reason why films have not yet been more introduced, although they possess great advantages and have lately become very reliable.

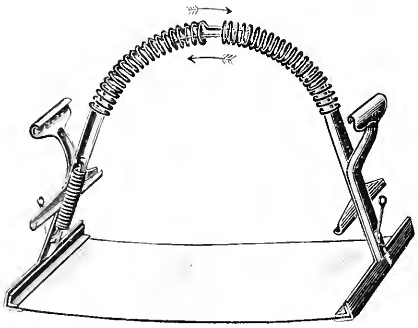


FIG. 1.

Many amateurs who use film cameras restrict themselves, as is well known, to the taking of the negative only, leaving all subsequent work to professionals.

For some people this custom may be quite satisfactory, but there is surely this great drawback in this proceeding, that one is generally obliged to delay the finishing of the photos until the whole roll is used up before they are given away to the professional.

It may frequently happen that a very long time elapses between the first and last "taking," and it cannot be surprising if the results in that case prove unsatisfactory, or even if the whole set of negatives proves a failure.

Many complaints in this respect have been made, and one dare say whoever works successfully with films must have first found out for himself in one way or another a method to handle the films.

Most common, I think, is the expedient of placing the film on a glass plate and fixing the same by means of two india rubber bands. This is comparatively easily done, and especially so when using a glove or board in order to quicken this manipulation and to shield the sensitive film from the red light.

Should, however, the film happen to slip out of one of the india-rubber bands, it will be found rather difficult to bring it back to its former position.

Without such a contrivance it will be very difficult to bring the film with one pull into the photographic bath or to remove the same out of it, and constant attention has to be given, in order to prevent the film from floating at the surface of the liquid, a thing which so easily happens with this light material.

It will further be impracticable to move the film to and fro in the bath in order to dispel from it air-bubbles adhering to the gelatine side; or one may have to dip the fingers in the liquid, which will certainly not contribute to cleanliness in working; on the contrary, it will cause many annoyances, and, in the case of amateurs, who do not always possess an efficient washing-apparatus (spray), it will render the result doubtful.

In view of these difficulties, different devices have lately been brought out, viz., pincers for roll films and supporting frames for stiff films of certain sizes, etc., but these instruments, however useful they may be for certain purposes, do not lend themselves equally well to the manipulation of all kinds of such thin materials, *i.e.*, *roll films*, or *stiff films*, or *papers of different sizes*, so that these materials can be easily adjusted, are kept flat, and can be handled at least with the same comfort as glass plates.

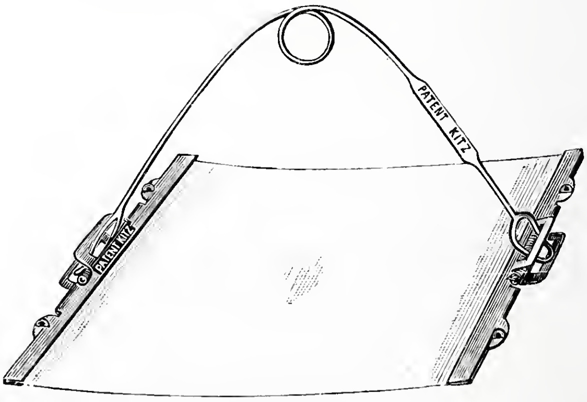


FIG. 2.

When experimenting with such-like thin materials, I have often vainly tried to purchase some instrument for handling them and keeping straight ; at last I have been obliged to get one made to order, which instrument has proved in every respect entirely satisfactory. As this device is a really practical one, permitting of use in many ways in photography, it has been decided to place this invention on the market, and therefore patent-rights have been secured in all countries where there may be sufficient interest for this novelty.

The stretcher consists of suitably shaped clips to grasp the film or paper with at its edges and of a suitable connecting-piece or handle to unite the clips. Keep them distended so that the film or paper is kept flat.

The latter arrangement permits the clips of being quickly separated from the connecting-piece, by simply pressing the stems of the latter. The film on paper fixed in the clips can then be put one upon another in a tray (for instance, for toning, fixing, washing, etc.). One can as well hold two sheets at the same time with this stretcher—emulsion side outward.

For drying, the papers or films are suspended at the ears of the clips on pins or one behind the other on a metal strip. The adjustment of the film or paper in the stretcher offers no difficulty whatever.

When larger quantities of films in strips are to be treated this work can be facilitated and simplified by the following combination on the same principle—Figs. 3 and 4—the effect of which is that a certain number of films cam be treated *at one and the same time.*

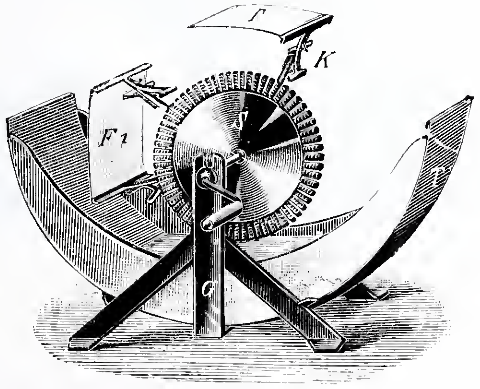


FIG. 3.

The film is adjusted in the clips, as above said, and is arranged around an axle, as shown in Figs. 3 and 4. The axle is placed over a suitably shaped tray, T, and provided with a crooked handle ; by turning the latter the whole strip is drawn through the developing bath. This arrangement requires smaller quantities of liquids and permits a very careful control of the state of development, and the process can at once be interrupted by lifting the axle out of its cushions.

For this purpose likewise the clips of Fig. 2 offer considerable advantages. One can place the strip of film (fixed at its ends in the clips) around a drum-like arrangement similar to Figs. 3 and 4 ; the ears of the clips can then be connected by means of some contracting device.

It may further be mentioned that some of the roll films, that have a great tendency to curl, can easily be flattened previous to the adjustment in the stretcher.

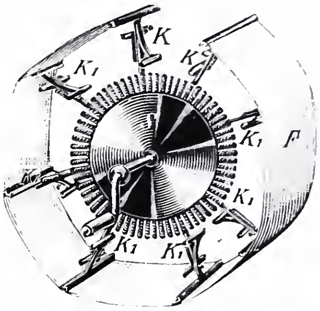


FIG. 4.

Cut two pieces of pure (black) pasteboard to the approximate size of the film—one of these pieces, that which is to serve as cover, should be about ¼ inch less in breadth than the other —so that the film overlaps at both sides, thus facilitating its being grasped at its edges by the clips. Place the larger pasteboard 1 on the table, then press with the edge of the cover-pasteboard 2, the edge of the film on board 1; unroll the film and follow with the cover-board gently pressing. *This is done in a moment and the film is shielded from the red light*

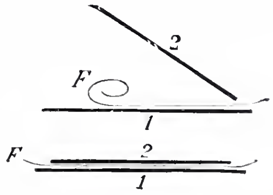


FIG. 5.

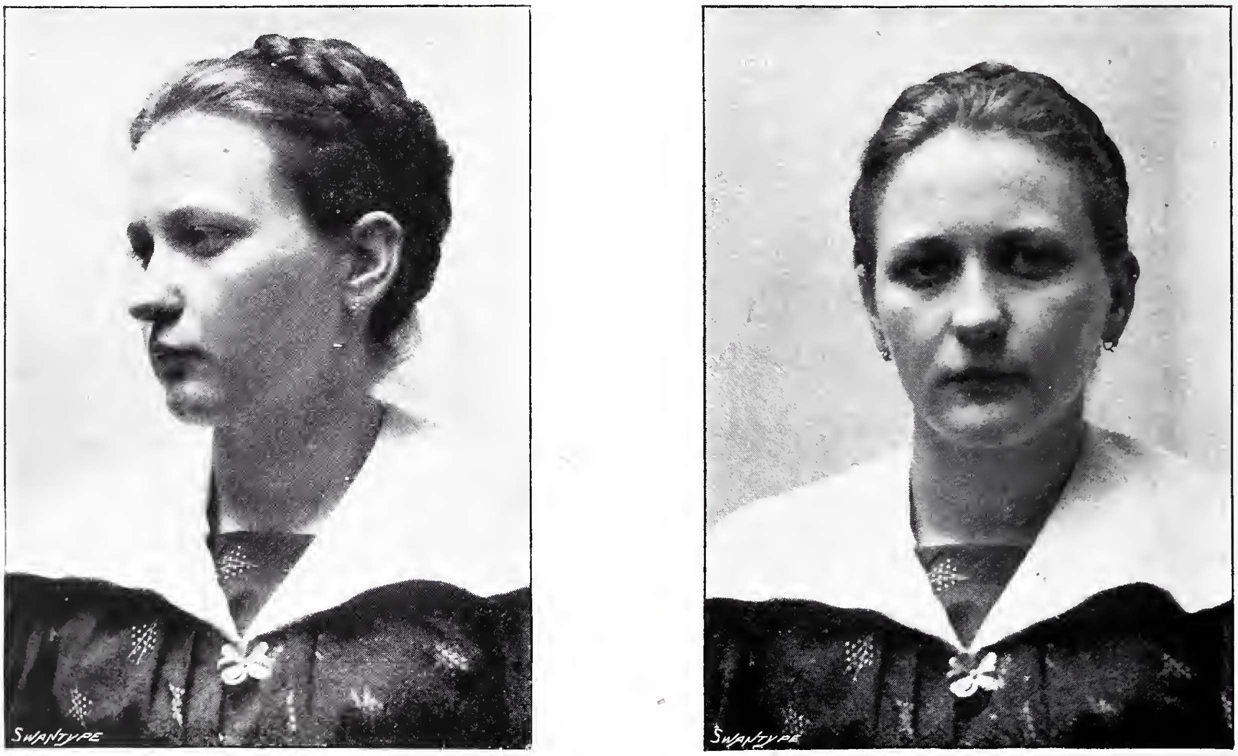
After this manipulation the pasteboards are dropped.

If preferred the pasteboards can be united by means of an elastic backing (book-cover-like), this cover is then simply clapped over the film before cutting from the roll.

In this way the cutting to size is also considerably facilitated.

BERGHEIM'S CINDERELLA.

FROM all parts of the world we have received letters expressing admiration for Mr. Owsley's very fine portrait study which appeared as a frontispiece to our March issue. Many of these communications contain requests for information regarding the method of making such pictures. Many argued that Mr. Owsley was fortunate in his model. Probably he was, but at the same time it does not follow that an exceptionally beautiful or characteristic head is necessary. One of the most notable examples of this was the picture entitled "Cinderella," by Mr. J. S. Bergheim, the well-known amateur photographer, which created such a sensation at the last exhibition of the Royal Photographic Society. This picture we reproduce on the opposite page, and two views of the model from which the picture was made are given here. For the loan of these cuts we are indebted to the kindness of Mr. H. Snowden Ward, editor of *The Photogram*. Referring to these pictures, Mr. Ward says: "Mr. Bergheim has taken for his model a very plain and unattractive young woman, and he has demonstrated so plainly, that all who run may read, two ways of working—one where taste, judgment and ability are shown in producing the result, and the other where they have formed no part of the work.



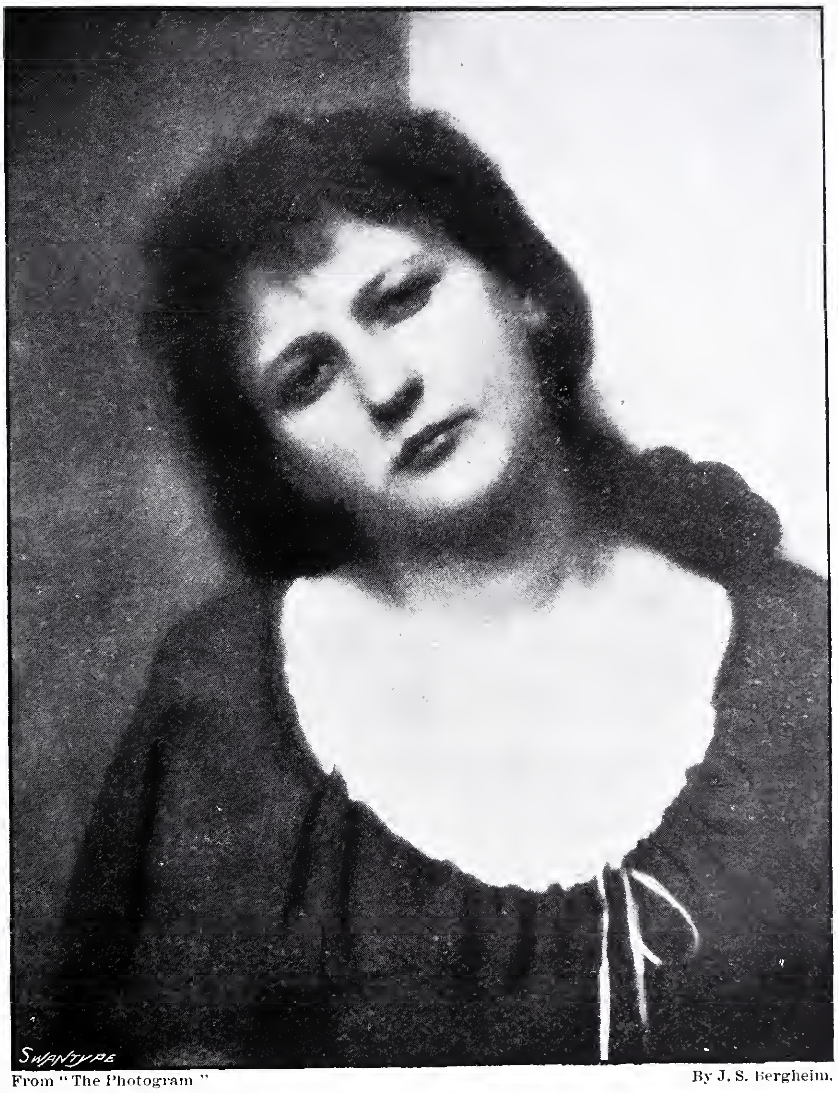
From "The Photogram."

By J. S. Bergheim.

CINDERELLA.

(As produced by the camera assisted by the man.)

"In one example we have a full-faced portrait of the model in a print dress with a large light-colored sailor collar; the hair is brushed away from the forehead and plaited at the back. The head is lighted with strong top light which admirably accentuates the unpleasing face. Note how the forehead, naturally large, is exaggerated by the lighting; note the heavy black shadows under the eyes, and the prominent cheek bones and chin; see how the modeling in the mouth is lost, being one dark mass. This is an admirable lesson of the ill effect of unduly strong top light which is so often carelessly used. If we can so easily get certain parts of the face altogether different from what they really are, and very often unpleasantly different, we should certainly be careful and pay attention to apparently simple things. A great artist once said to a student whose work was false, 'There are more ways of telling a lie than one. You can tell lies with paint, and that is what you are doing!' And the same principle applies to



From "The Photogram" By J. S. Bergheim.

CINDERELLA.

(As produced by the artist assisted by the camera.)

light and shade in monochrome. Note, also, how the head is practically dissevered from the body by the ocean of light collar, almost of one unbroken tone. Again, the background is nearly of one shade throughout. Striking, too, is the extremely 'common' appearance given to the face by the little earrings and the 'bon marché' brooch.

"In the next portrait we have same face taken nearly full profile, and the effect is as unpleasant as the other. Note particularly the ugly appearance presented by the nose.

"Next we have a very beautiful portrait of the same model. Here the picture is produced in the simplest possible manner. There is no straining after effect, no elaborate costume or accessories, and there is no retouching. The hair is loosened, and the print dress has been banished. Gone, also, are the brooch and earrings. In place of the dress we have a simple piece of gathered drapery, and the breast is relieved with a little of the white vestment. The head is beautifully posed and the lighting is excellent over the whole face; you can find no part without gradation. See how the large forehead is rendered less noticeable by covering a portion with a loose curl of hair. The definition of the picture is pleasingly soft, and altogether the effect is very charming."

Regarding these pictures Mr. H. P. Robinson, in the *Photographic News*, says:

"In the present Pall Mall Exhibition is one frame which puzzles many, but delights those who find in it convincing proof of the difference, either for better or worse, that can be made in the representation of a model, the last convincing link in the chain of evidence that photography in capable hands may become art. It shows clearly that our art is not bound by compulsory fact, and is under some control. The title is perhaps too imaginative for the understanding of a scientific society, but the exhibit almost amounts to a scientific demonstration, and, therefore, was not suitable to the walls of the Salon, which deals with results, not processes, and was very properly sent to the Photographic Society of Great Britain, where, however, having something to do with art, its scientific value was not recognized by the hangers, and it is hung so high that the upper part of the frame is not easily seen. Perhaps its novelty of idea and clearness of demonstration were too much for the scientific judges, who do not believe in, or are afraid of, art in photgraphy, or perhaps the recollection of the laugh against them over the 'Proud Turk' by the same artist of the previous year, made them fearful of being the victims of another 'sell'; anyway, this frame, containing a most valuable and convincing lesson, is not medaled, notwithstanding that several ordinary photograms, not above the usual level, and a bit of very ordinary photogravure, achieved that doubtful distinction. The frame I allude to is 'No. 410, "Cinderella." Three portraits from the same model, not retouched. By J. S. Bergheim.'

"This ingenious artist shows the transformation of mechanical photography into ideal art in this wise. Two of the prints in his frame are ordinary photograms of a very plain, if not ugly, girl, typical of the commonplace; you would guess her to be a factory hand. The remaining print represents a refined, spiritual, almost beautiful girl. They are all three from the same model. The change has been made by aid of the fairy godmother—knowledge of art and those grand aids to pictorial effect, a mastery of the mystery of light and shade, and what may be called the artifices of linear composition, and the aid of varying focus. Almost any professional photographer would say that the commonplace heads badly wanted retouching; and, on the other hand, it would be difficult to show where the most inveterate retoucher could lay a pencil point on the wonderfully soft and tender face of the spiritualized model. Yet there still exist those who ignorantly or willfully deny that the photographer, by the use only of his legitimate tools, has any power over expression, any opportunity of changing the aspect of nature, or putting his own thought and feeling into his work. There always have been doubters, even in the presence of demonstrated fact. Sometimes it is obstinacy, sometimes innocent want of perception, and sometimes—at once the strongest and meanest inducement of all—it pays."

* * *

A TAIL PIECE. BY F. M. SUTCLIFFE.

* * *

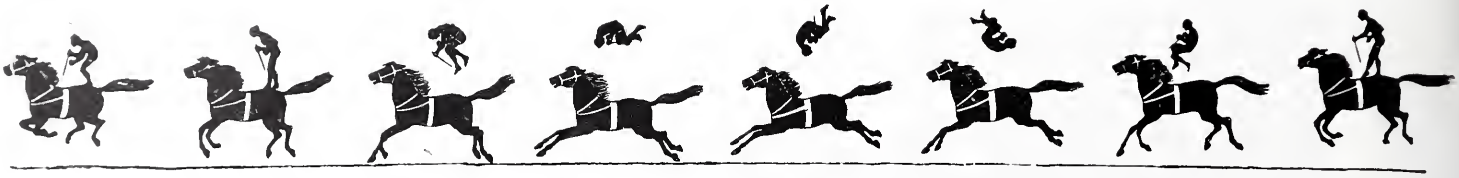
SOME NEW INDUSTRIES.

BY C. F. JENKINS.

WITHIN a few days of the publication of this issue of THE PHOTOGRAPHIC TIMES, there will be on exhibition in Washington a stereopticon of peculiar construction which will project pictures upon a canvas in such manner as to give the startling effect of objects in motion, *i.e.*, dancing girls, racing horses, etc. Niagara will be so truly portrayed that nothing new will be seen by the visitor when he beholds the real wonder. The underground workings of coal, silver and gold mines; such awe-inspiring waterfalls as the Shoshone, in Idaho, the grand falls of the Northwest River, of Labrador, etc., ntterly inaccessible to but the boldest and most hardy explorers, can be exhibited in all their grandeur in a drawing room or comfortable theatre.

This is a surprisingly entertaining machine to-day, but before many months such exhibitions will excite no more astonishment than does the ordinary stereopticon, so readily do we accustom ourselves to remarkable achievements. The device consists, generally speaking, of a cabinet about 42 by 22 by 18 inches, in which are arranged two banks of spools which support and feed forward a film or tape upon which is arranged a series of pictures, each picture being slightly different from its neighbor and representing a bit of mimic life. Upon the top of the cabinet is a modified arc-light stereopticon apparatus so arranged as to project the pictures on to a screen set to receive them. They are projected in such rapid succession that the persistence of vision deceives the observer into the belief that he sees an uninterrupted life-sized picture of objects in motion.

The construction and public exhibition of these machines will, of course, create a demand for many hundred miles of picture-carrying tape per annum, without an unlimited supply of which such delightfully entertaining machines would be utterly useless. To supply the machine with these tapes will promote the introduction of several new industries, the prinpal one being the manufacture of these tapes and the arrangement of interesting pictures thereon. The celluloid strips now in use for this purpose are very unsatisfactory. They are not flexible enough, get dry, curl up, break, and generally behave very badly. Silk has been suggested and seems to be superior to celluloid, although its utility has not yet been conclusively demonstrated. It would seem that paper would be the most satisfactory, although a suitable quality has not been submitted. A bath of dilute sulphuric acid makes

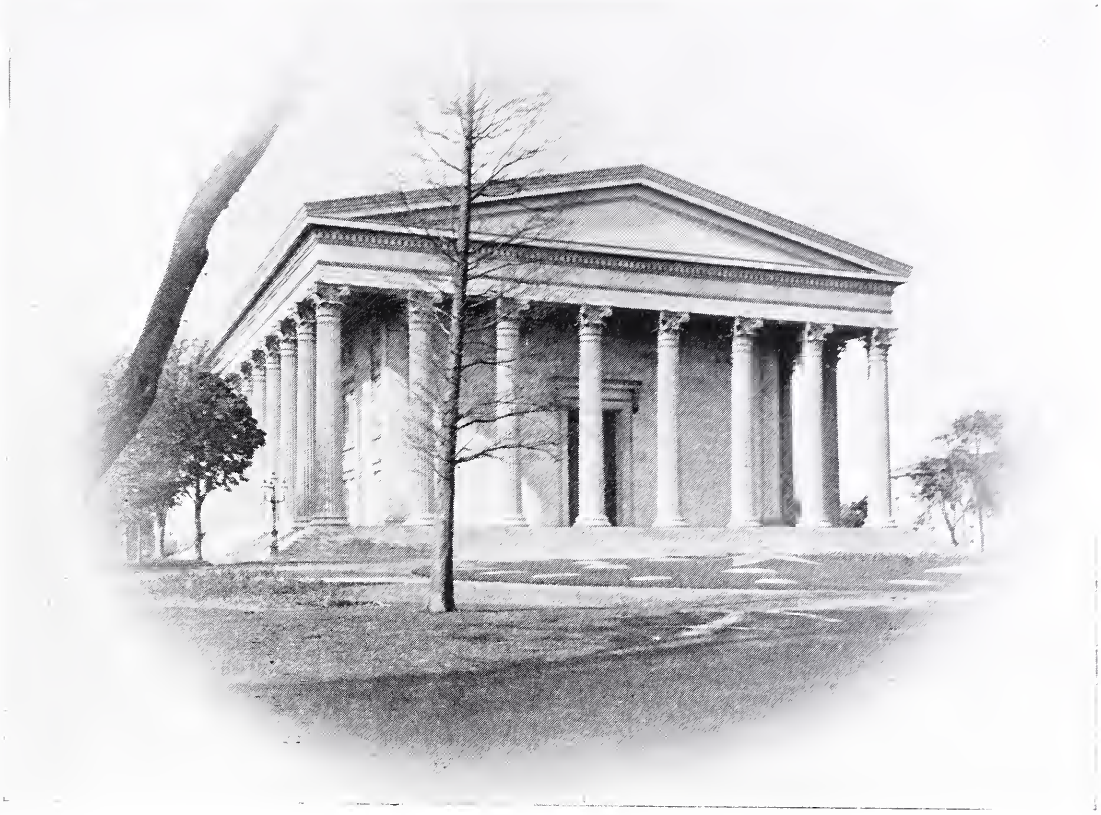


a very tough, parchment-like tape which is soft, elastic, requires but small effort to make it conform to any desired shape or succession of shapes, and its preparation would seem to offer a field for profitable research. At present, however, the necessity remains for making it transparent. What is needed, therefore, is a tape which will stand considerable tensile strength, which will not warp, is transparent, and capable of being produced in unspliced lengths of not less than one hundred feet, such tapes being afterward coated with a silver or similar solution.

The construction of cameras capable of taking pictures at a maximum rate of 75 per second is no mean problem, for the capacity of the tape must be not less than one thousand pictures. However, two successful machines have been made in which exactly opposite methods are employed. One uses a negative surface which is stopped and started to accommodate itself to the exposures; in the other the negative surface is kept constantly moving. The former uses a lens across the axis of which a shutter, with a slit in its rim, is made to revolve in such manner that light is admitted once each revolution. The negative is stationary during the exposure, but is jerked forward, the width of one picture, in the interim.

In the other machine the negative is fed forward at a constant and unvarying rate of speed, the light meanwhile traveling synchronously with the negative; that is, when light is admitted through the lens and impinges upon the negative, it does not depart from the position it first occupied upon the negative even though the negative moves quite a distance before the light is cut off entirely. In this manner the exposures can be regulated to correspond to the sensitiveness of the negative. This, however, is true only in a limited degree as the exposure must accommodate itself to the rapidity of the motion of the object photographed; and, in order to deceive the eye when being reproduced, the pictures must be taken at a minimum of thirty-five per second. If too few pictures per second are taken the reproduction will be faster than the original action; if too many pictures are taken the action, when the machine is speeded the same as before, will be slower than the original. Therefore, the requirements in a camera of this character are, a machine capable of photographing at a maximum rate of seventy-five pictures per second, which shall be small, portable, and provided with extremely rapid lenses. Up to within a short time this method of photographing had never been considered, or, if considered at all, thought to be absolutely impossible.

There are many uses for a camera of this kind other than the preparation of films or tapes for reproduction. For instance, with it we are able to catch the different phases of life-motion, which would otherwise be utterly impossible. For example, of a running horse jumping a hurdle, seventy-six pictures have been taken, and the surprising fact was then discovered, upon an examination of the photographs, that the horse landed with all four feet on the ground at once and so close together that one might have encircled them with his arms. A photograph of the wing of a flying pigeon resembles a propeller blade, the cutting angle of which increases as we move along the wing. A cat dropped back downward from a height of say sixty inches will turn over and land on his feet. The feet are drawn up against the body in a peculiar manner and the turn made while falling through a distance of only thirty or thirty-five inches. All the cats experimented with made the turn the same way; that is to say, left-handedly, although it is doubtful if this would invariably be the case.



GIRARD COLLEGE, PHILADELPHIA, PA.

COPPER HALF-TONE ENG.

SPRING GARDEN WATER WORKS, PHILADELPHIA, PA.

PHILA. HELIOGRAPHIC CO.

PHOTO-ENGRAVED FROM HALF-TONE NEGATIVE ON DRY PLATES
(CARBUTT'S PROCESS.)

See article "Dry vs. Wet Plates,"
for Half-tone Engraving

DRY VS. WET PLATES FOR HALF-TONE ENGRAVING.

BY JOHN CARBUTT.

SINCE the advent of what is now called the half-tone photo-engraving method, the making of the negative has, by the majority of operators, been accomplished by the wet collodion process, as the more rapid gelatino-bromide plate was not amenable to the treatment of clearing and intensifying used in the wet process. It is the purpose of this article to show and prove, that, by the use of a specially prepared process plate made by the writer, equally as fine half-tone blocks are produced as by the wet plate process, and have been used for a year or more past by firms who formerly used the wet plate method, but have laid it aside to the exclusive use of the gelatine process plate. As the gelatine plate is always ready for use, and more sensitive than the bath plate, and the time taken up in developing, clearing and intensifying, being about the same as the wet plate, much valuable time is saved, besides relieving the operator of preparing collodion, keeping silver baths in order, etc. The same plates are used in producing negatives of pen drawings, reproduction of wood engravings for transfer to stone, or producing deep etched blocks. The following solutions are required for developing, clearing, fixing, reducing and intensifying the process plates:

Developing Formula for Half-Tone (Screen) and Negatives of Pen Drawings.

No. 1.

Neutral oxalate of potash	1 pound
Warm water (free from lime salts)	48 ounces

Add of a strong solution of citric acid enough to just turn litmus paper red.

No. 2.

Sulphate of iron	½ pound
Warm water	24 ounces
Sulphuric acid	15 drops

No. 3.—Restrainer.

Potassium bromide	½ ounce
Water	10 ounces

To Develop.

To 5 ounces No. 1, add 1 ounce No. 2 and 10 drops No. 3.

To get an even developed plate, use sufficient developer to well cover the plate, allow to act until, on looking through, the image appears quite dense, then wash and place in clearing bath one or two minutes.

No. 4.—Clearing Bath.

Water	20 ounces
Alum	1 ounce
Citric acid	¼ ounce

Again wash and immerse in fixing bath.

No. 5.—Fixing Bath.

Water	6 ounces
Sulphite soda	2 ounces
Water	2 ounces
Sulphuric acid	1 drachm
Water	48 ounces
Hyposulphite soda	1 pound
Water	8 ounces
Chrome alum	1 ounce

Dissolve in the order given, add the solution of sulphuric acid to the sulphite of soda; add this to the hyposulphite, and finally add the solution of chrome alum.

No. 6.—Reducing Solution.

Ferricyanide Potassium	50 grains
Water	10 ounces

No. 7.—Bleaching Solution.

No. 1.

Bichlor. mercury	240 grains
Chloride ammonia	240 grains
Distilled water	20 ounces

No. 2.

Chloride ammonia	340 grains
Water	20 ounces

No. 8.—Cyanide Silver Solution.

Distilled water	6 ounces
Cyanide potass. C. P.	60 grains
Distilled water	2 ounces
Nitrate of silver	60 grains

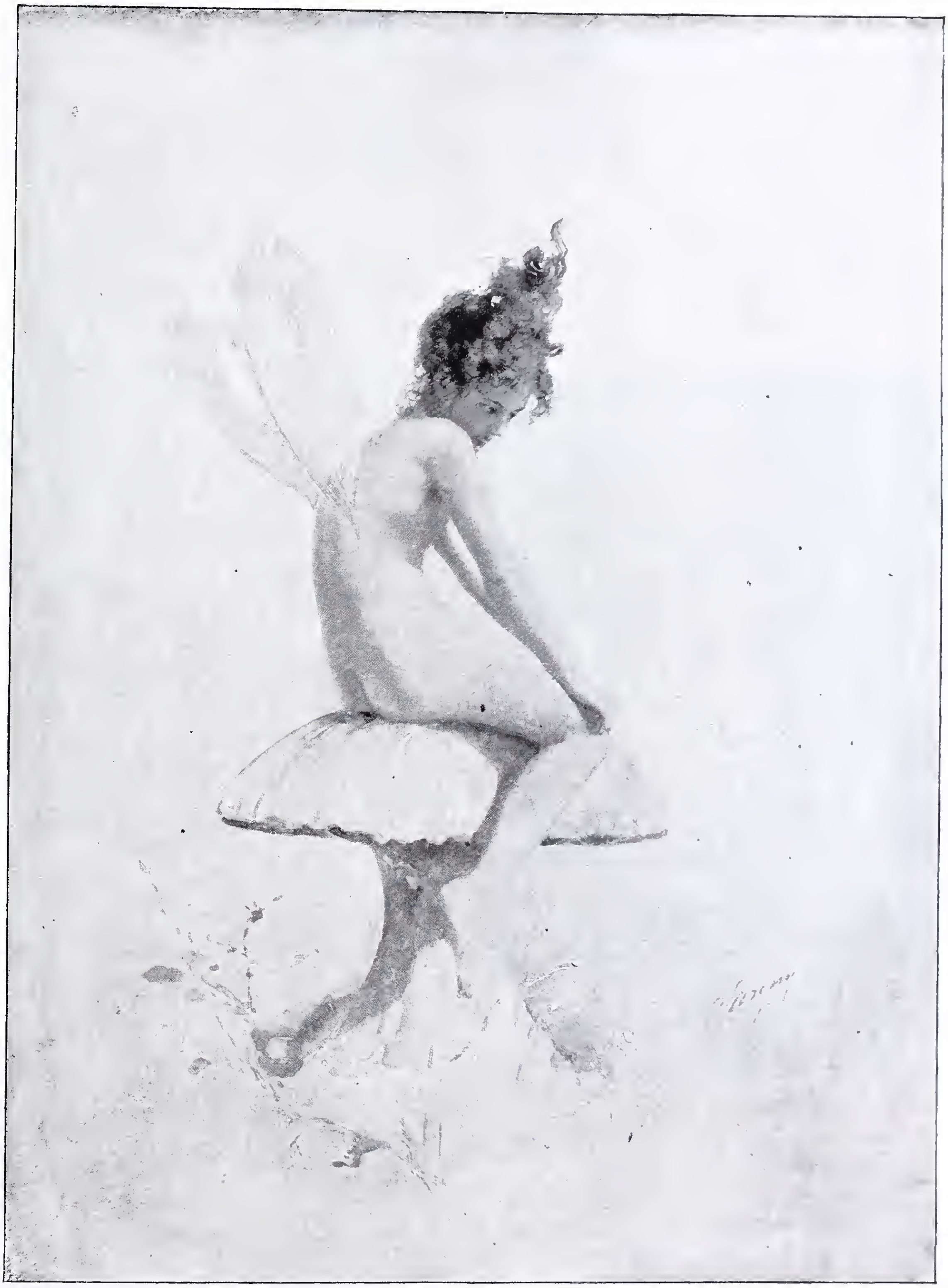
Pour the silver into the cyanide solution while stirring, and mark bottle *Poison*.

Notes on using the foregoing Solutions.—Supposing that 6 ounces of developer are mixed, and a number of plates are developed, if bulk is reduced to 4 ounces, add 2 ounces of a fresh mixture and no bromide; also if what is left is placed in a bottle, on using it the next day, mix half of it and half of fresh mixed developer, and it will be found to work more uniform than the developer freshly mixed, the old acting as a restrainer. *Always* use No. 4 solution after washing off the developer, as its function is to remove any trace of iron left in the film, which if not removed will leave an opalescence in the clear spaces, also to harden the film and prevent its swelling up. After a stay of not less than two minutes in No. 4 solution, the negative is thoroughly rinsed and placed in No. 5 fixing bath, and when thoroughly cleared, remove. Do not proceed to wash out the hyposulphite as is ordinarily done, but simply *pass* the negative through water to remove the surplus hypo solution on surface, then examine with magnifying glass to determine whether any reducing or clearing is required, either as a whole or locally, which I consider is best done at this stage, as the hypo left *in* the film acts with the reducer—ferricyanide of potash—much better in clearing the transparent places; then if a mixture of hypo and ferricyanide were used after all hypo had been washed out, the 5 grains solution of No. 6 can be used as a bath in a white porcelain dish, and the reducing effect watched closely, then removed, and its action immediately stopped by washing. If any part of the negative is found to require local reduction, the No. 6 solution can be applied to the part to be reduced, with a tuft of absorbent cotton, or large round camel hair brush, and then washed to remove all hypo. If intensification is required it is best done after the negative has been allowed to dry, but as time is of the utmost importance in this class of work, intensification can be done now, the only danger being of any hypo remaining in the film, which would cause a yellow stain after being intensified. To avoid this place in No. 4 for one minute, then wash and place in the mercury solution until whitened, then wash again, and reduce the chlorized image to black, either with a 10 per cent. solution of sulphite of soda or the cyanide of silver solution; the latter gives the clearest and most dense deposit; wash for a few minutes and dry spontaneously; or, if desired to dry quickly, it may be dried in warm air at a temperature of 90 to 100 deg. Where electric light is used, if the negative is placed before a small electric fan, it will dry very rapidly, as the film of gelatine on these process plates is very compact, and does not swell up to any appreciable extent. I think I have now explained sufficiently the mode of using the process plate for producing half-tone negatives from which blocks can be made that will furnish prints of the highest quality, and enable those who are tired of the vagaries of the *old* wet method, to realize that time, patience and money is saved by adopting the *new*. For those who do not use a prism to reverse the image, Carbutt's Stripping Process Plates can be used, and are treated just the same as plain plates; when dry they are placed on a leveling stand, on three points, brought to a level, the plate covered with Carbutt's Stripping Medium, using 2 ounce for 8 x 10 plates; 1½ ounce for 6½ x 8½; ¾ ounce for 5 x 7. In a warm room it will dry in 12 hours, or over night.

The illustration accompanying this article are examples of commercial work, produced as described from gelatine process plates.

* * *

SUMMER DAYS. BY DR. J. STRAKOSCH.

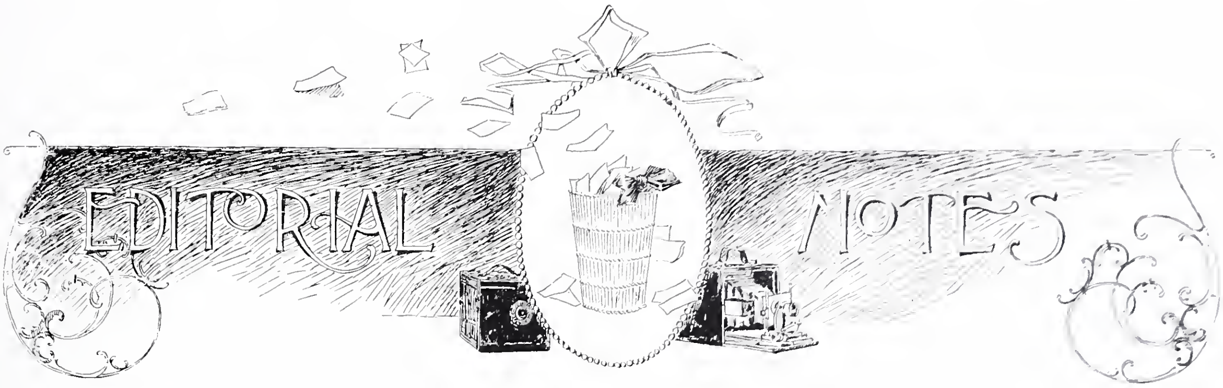


PHOTOGRAPHED FROM LIFE.

Copyright, 1895, by Napoleon Sarony.

"A FANTASY."
BY NAPOLEON SARONY.

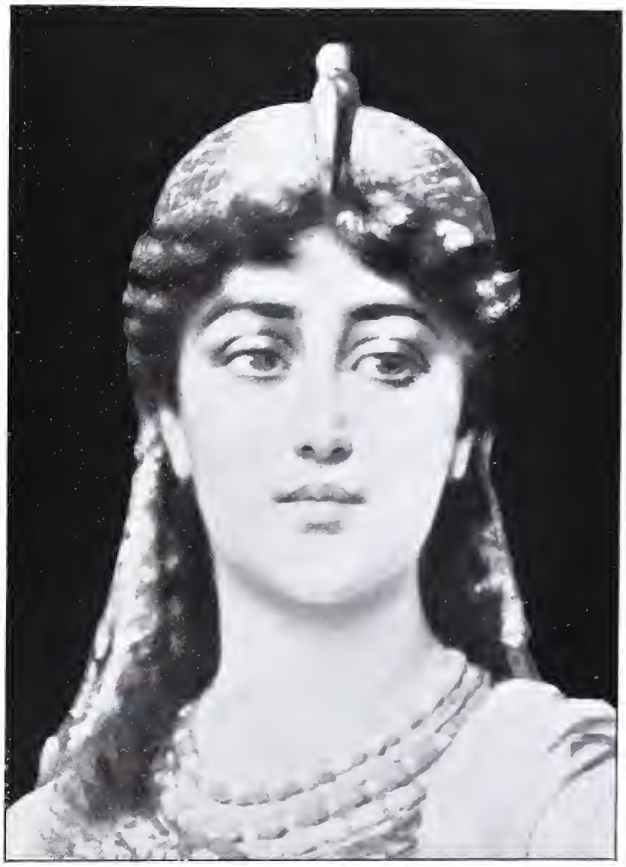
From "Sarony's Living Pictures."
By permission of the publishers, A. E. Chasmar & Co.



EDITORIAL NOTES

IN our March issue we published an article by Mr. Meredith B. Little upon the subject of so-called "spirit" photography. In this Mr. Little detailed his experiences with the spirit artist, and knowing nothing of the tricks of the trade was led to believe that the images formed upon the plate were genuine photographs of invisible "spooks."

In the editorial notes of the same issue we criticized these pictures from a purely photographic standpoint, and for reasons which we gave we decided that the "spirit" forms had been made from some image or picture and not from any persons or spirits alive or dead. In making such a statement we did so in the hope that our readers would take it for what they thought our opinion was worth; we never hoped to be able to prove the correctness of it beyond all shadow of doubt. It was not by any discovery of our own but by a well-known amateur in photographic circles. Mr. William M. Murray is a gentleman well posted on the works of ancient and modern artists, and on viewing the spirit photographs which we reproduced on page 143, he was struck with the resemblance of one of the spirits to the peculiar type of female face which is characteristic of the work of Sichel, a well-known painter. A little search revealed the fact that the "spirit" was an out-of-focus copy of Sichel's painting called "Niletus," which we reproduce herewith. There is no mistaking the fact, the face, position, lighting, and everything else is exactly alike in both cases, allowance being made for the want of sharpness in the spirit. The top portion of the head gear has been masked and also the neck cut round. If anything is wanting in this chain of evidence one has only to notice the white mark appearing through Mr. Little's hat and hair, and note what portion of the painting this really is.



PAINTING BY N. SICHEL.

From which "Spirit" Photograph was made.

So much for spirit photographs and photographers. As a rule these tricksters are remarkably cautious and clever, but we certainly advise this one to close up his shutters if he hasn't got more sense than to make use of paintings, copies of which are sold in large numbers.

Mr. Carbutt's article upon the subject of dry plates *vs.* wet for photo-engraving processes will, we feel sure, be read with interest by many of our readers. The subject is undoubtedly a very important one. The modern rapid gelatino-bromide dry-plate process has supplanted the old-fashioned and tedious wet collodion process for every other purpose except for photo-engraving work, either line or half-tone. The necessary qualifications in a negative for this purpose are absolutely opaque density in the blacks and perfect transparency in the whites. Mr. Carbutt has shown us some samples made upon his new process plate, and we have no hesitation in saying that they were in every way equal to any collodion negatives we have seen, and we think the day is not far distant when the dry plate will be used in place of the wet in all the photo-engraving establishments of this country.

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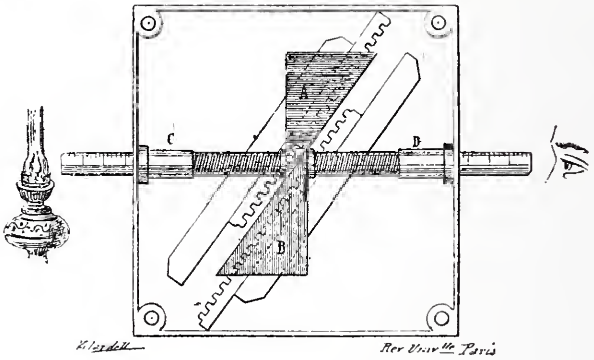
M. Tournier, a French Scientist, has invented a new form of photometer; the principle of this apparatus depends upon the employment of a translucent plate whose thickness, and consequently the transparency of which, can be varied at will, between such limits that, if the apparatus is placed between the eye of the observer and the source of illumination, there comes a time when the latter disappears. The amount by which it has been necessary to augment the thickness of the translucent plate to obtain this result will be a function of the intensity of the luminous object.

M. Tournier accomplished his object as follows: The translucent plate is formed by the superposition of two equal prisms, A and B, colored glass, porcelain, etc. They have one right angle, and the other angles are such that a ray traversing the prisms never suffers total reflection. Sliding the prisms upon one another with their hypothenuses superposed gives a plate of variable thickness with parallel focus. For this purpose they are mounted on two racks, operated by a common pinion which may be turned from the interior of the box in which the whole apparatus is mounted. In two sides of the box are pierced two openings, C and D, for the passage of two tubes, one end of each of which rests lightly on the prisms, being held in contact by means of a spiral spring. To graduate the apparatus, it is placed at a distance of a metre from the source of illumination chosen for a standard, and after having moved the prisms to the position shown in the figure, then observing the light through the tubes, turn the thumb-screw until the extinction of the luminous point. Then, on one of the tubes at the last point where it leaves the box, make a mark corresponding to 1=unit. Repeat the operation with sources of illumination, 2, 3, 4, etc., times as great, marking on the tubes 2, 3, 4. Continue until the prisms reach their limit of movement. The prisms not being fixed may be replaced by others more opaque, and the graduation of the other tube thus accomplished, after which it is only necessary to subdivide these primary divisions. To measure the illuminating power of any luminous object whatever, it is only necessary to observe it through the instrument, placed at a distance of 1 metre, and move the prisms gradually until the light disappears. The power is then read directly from one or the other of the tubes, according to which pair of prisms has been used.



TOURNIER'S PHOTOMETER.

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About a year ago the announcement was made of the discovery of a new element in the atmosphere. The statement was received with considerable doubt by many of our scientists, but the proofs recently adduced in a highly interesting form at a lecture given at the Royal Institute are likely to convert the more incredulous. This new element, discovered by Lord Rayleigh and Professor Ramsey, has been termed by them "Argon."

"There is still some doubt," says *The Stevens Life*, "whether this strange, inert gas, which defies some of the best known laws of physics, consists of one or two primary elements. The discoverers have finally succeeded in separating it from the atmosphere on a large scale and have sent a portion to Prof. Crookes, the eminent spectroscopist, and a portion to Dr. Olstewski, of the University of Cracow, to liquefy and solidify. These great authorities have found that the new substance gives a spectrum of its own and has its own boiling point, freezing point, critical temperature and critical pressure, that are all different from those of any other element. One of its properties is its invincible reluctance to combine with anything else. It will have nothing to do with oxygen, chlorine, phosphorus, sodium, platinum, or various other substances. Even the electric arc does not make it take companionship with anything."

One important quality is a great puzzle. All the heat given to the new substance produces only the motion of translation. In another respect argon presents difficulties. The great Russian chemist, Mendelejeff, has discovered an empirical law which associates the properties of elements with their atomic weights. Now the new element has a density of 39 or 40, which does not fit this law. Argon gives two spectra, the red and the blue, and it is this which raises a doubt whether the investigators are dealing with one or two substances. If the latter should prove true, then there is a new vista opened up, and it is suggested perhaps one of these substances will prove to be Prof. Crookes's ideal protyle, the ultimate basis of matter from which all others are only combinations.

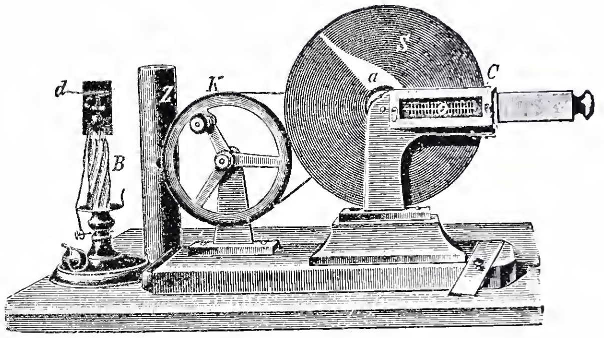
* * *

Otto Tapfer, in Potsdam, has brought out a new sensitometer due to Prof. Scheiner. The revolving disc S contains an opening *a*, and is set in rapid motion by crank wheel and band K. Behind the disc is arranged the plate holder C; arranged as follows: In the front side, right under the slide, is a metal plate, which contains 20 equadistant rectangular openings. Directly behind this pierced plate is a thin gelatine film, in the centre of which and crossing all the rectangular openings is drawn an opaque line, and the rectangular openings are numbered from 1 to 20. The photographic plate is placed directly against the gelatine film, sensitive side toward it. When the apparatus is set in motion, rectangle No. 1 receives only $\frac{1}{100}$ of the light that falls upon rectangle No. 20. For the intervening rectangles the light is distributed in the proportion of 1.27 from rectangle to rectangle. The distance of the flame from the apparatus is 1 metre, governed by a chain which connects the lamp to the apparatus.

The distance of the light, opening in disc and size of rectangular openings, are so chosen; for an exposure of a minute, with a moderately sensitive plate, a trace of action may be seen in the middle rectangles; for a slow plate, the action extends to the first three or four, and for the most rapid plate no impression is made under the last rectangular opening. The intensity of illumination is given by Scheiner as follows;

Intensity.	Intensity.	Intensity.	Intensity.
No. 1—1.00	6—3.36	11—11.3	16— 37.9
2—1.27	7—4.28	12—14.4	17— 48.3
3—1.63	8—5.45	13—18.3	18— 61.6
4—2.07	9—6.95	14—23.4	19— 78.5
5—2.64	10—8.86	15—29.8	20—100.0

Suppose a comparison of these plates is to be made; a strip of each sort is exposed 1 minute in the sensitometer; after development they are laid upon a piece of white paper. Suppose that in the first the cross line cannot be distinguished in rectangle No. 9, but in No. 8. In the second plate the limit 13 and 14; for the third plate No 16 the limit. These numbers correspond according to the preceding table to 5.5, 16.4 and 37.9,—that is, the plates are sensitive in this proportion to that taken as a standard,—giving the relative sensitiveness of these three plates as 1:3:7.



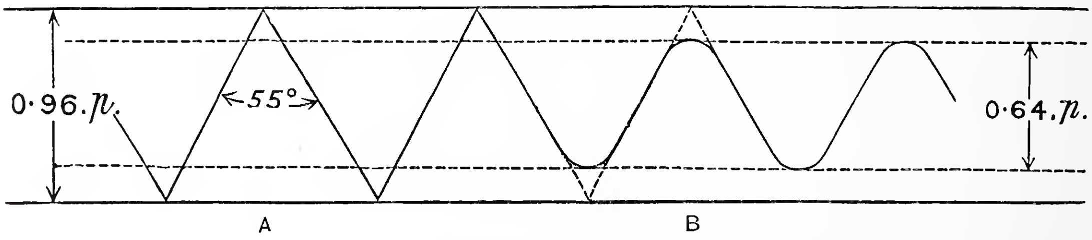
TAPFER'S SENSITOMETER.

* * *

In our last month's notes we made some mention of the standards for diaphragms and lens mounts and fittings proposed by the Royal Photographic Society. A very fine set of the lens mounts has been presented by this Society to the American Institute at 113 West 38th Street, New York, and can be viewed by anyone interested in the matter. We think that the lens manufacturers of this country should carefully examine these standards and consider the advisability of adopting them.

In the report of the Royal Society it is recommended with respect to lens diaphragms: 1st. That the aperture of the standard-unit diaphragm have a diameter equal to one-fourth the equivalent focal length of the lens; 2d. That diaphragms with smaller openings have apertures diminishing in area to the extent of one-half from the unit standard downward: 3d. That every diaphragm be marked with its intensity ratio, and also with the relation that the diameter of its aperture bears to the equivalent focal length of the lens, thus: 1 *f*/4; 2 *f*/5.6; 4 *f*/8; 8 *f*/11.3; 16 *f*/16; 32 *f*/22.6; 64 *f*/32; 128 *f*/45.2; 256 *f*/64; etc.

Should a lens not admit of a diaphragm with an aperture as large in diameter as one-fourth its focal length, nor exactly any one of the above-mentioned sizes, it is still recommended that all the apertures be made in uniformity with the above scale, with the exception of the largest, which should be marked with the number its area requires in relation to the unit diaphragm. In the case of a lens having a working aperture exceeding in diameter one-fourth its focal length, the diaphragms should be marked according to the sizes of their relative apertures, for example: 0.5 *f*/2.8; 0.25 *f*/2, etc. And diaphragms which require to be made with apertures intermediate to the standard sizes should be marked in a corresponding manner.



With regard to a standard for lens mounts and fillers it is recommended:

1st. That the equivalent focal length of each lens be engraved upon its mount.

2d. That the following series of Screws for Photographic Lens Flange-fittings be adopted:

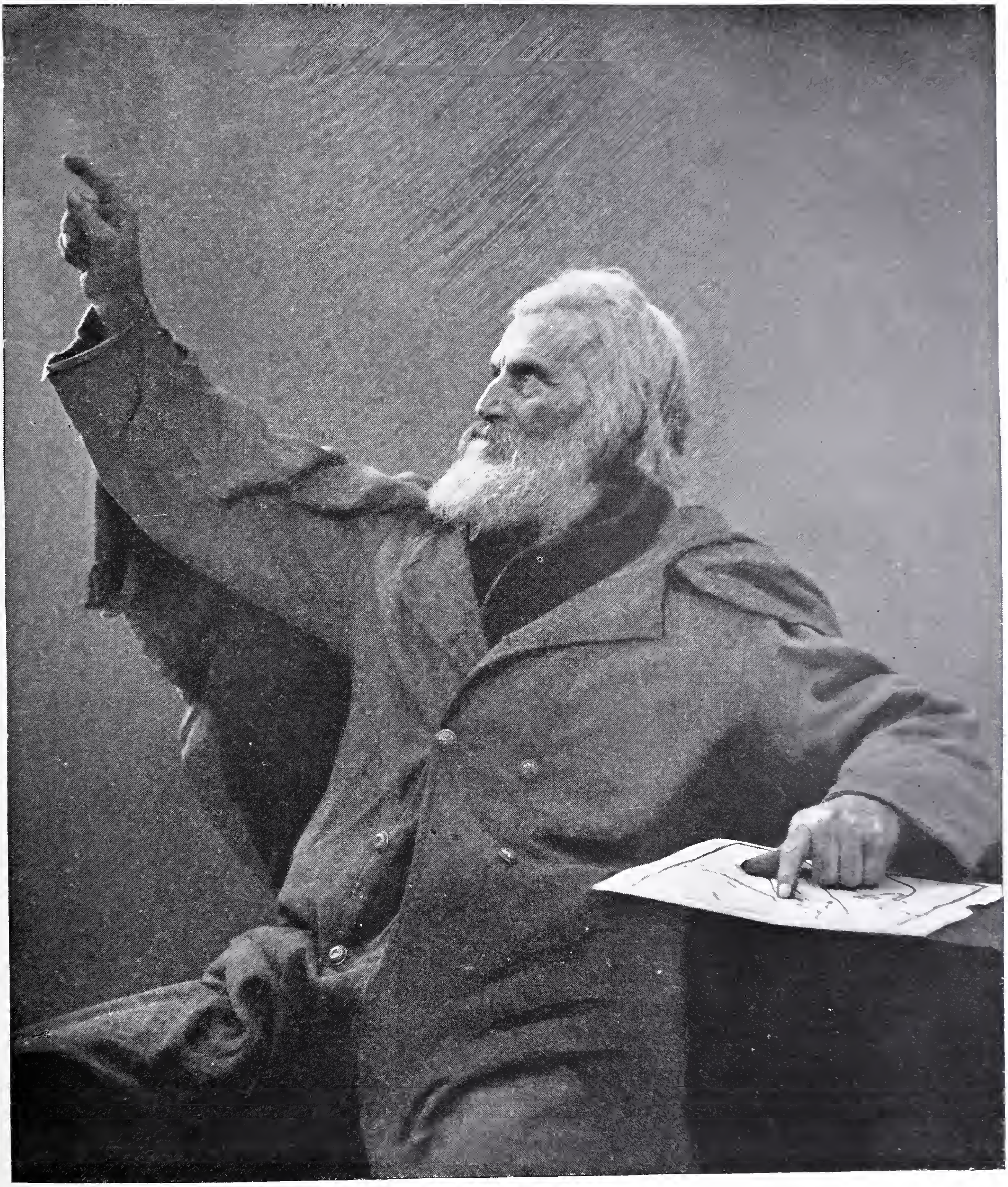
Diameter in inches.	No. of threads per inch.	Core diameter in inches
1	24	·9466
1·25	24	1·1966
1·5	24	1·4466
1·75	24	1·6966
2	24	1·9466
2·25	24	2·1966
2·5	24	2·4466
3	24	2·9466
3·5	12	3·3933
4	12	3·8933
5	12	4·8933
And upward, advancing by inches	12	

The form of thread is that known as Whitworth's Angular Thread, and is designed as shown in accompanying diagram.

Two parallel lines, at a distance apart equal to 0·96 of the screw pitch, are intersected by lines inclined to each other at fifty-five degrees, as shown in the figure at A. One-sixth of the vertical height of the triangular spaces so obtained is rounded off both at the top and bottom, leaving the form of the screw thread as at B. The depth of this thread is 0·64 of the screw pitch.

3d. That every flange and adapter have a mark upon its front to indicate the position of diaphragm slot or index of any lens when screwed home. The mark on any adapter should coincide with the mark upon any flange into which it is screwed. This mark should be placed at the point at which the thread becomes complete at the shoulder of the flange or adapter.

It is recommended that all screws fitted to cameras either for attachment to the stand, for fixing rising fronts, or for other movable parts, be either $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, or $\frac{3}{8}$ of an inch in external diameter, and in pitch of thread and other details in accordance with the generally recognized Whitworth standards for these sizes.



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A VETERAN'S TALE
BY CLARENCE B. MOORE.

(1) ON SOME NEW METHODS OF OBTAINING PLATINO-CHLORIDES. (2) PROBABLE EXISTENCE OF A PLATINUM SUBCHLORIDE.*

BY M. CAREY LEA.

The methods now in use for obtaining potassium platino-chloride are : (1) Heating platinic chloride to 250 to 300 degrees Cent. and treating with potassium chloride. (2) Passing sulphurous acid through a boiling solution of platinic chloride and treating with potassium chloride. To these older methods Thomsen has added (3) treatment of potassium platinic-chloride with cuprous chloride.

All these have objections. With (1) it is not easy to obtain a uniform conversion ; (2) requires to be very closely watched to catch the exact moment at which the change is complete; (3) is liable to a vexatious reverse action by which platinous salt is reconverted into platinic salt at the expense of the cupric chloride present. Thomsen mentions this danger as occurring in hot solutions. It probably depends, however, more on concentration than on temperature. The larger the proportion of cupric chloride present in any solution, the greater the tendency to reversal. In one case ½ litre of mother water containing platinous salt was set aside for spontaneous evaporation. In a few days large crystals of the red salt began to form ; in a few days more, instead of these increasing, there was not a crystal of the platinous salt left.

These objections led me to look for something different. I have found two methods, either of which gives good results.

First Method. Potassium Acid Sulphite.

Potassium platinic chloride is to be moderately heated with solution of the acid sulphite ; convenient proportions are : platinum salt, 12 grammes ; acid sulphite, 9 grammes ; water, 160 c.c. The mixture can be placed over a hot-water bath in a covered vessel and left to itself. The reduction takes about ten to twelve hours, and is known to be complete when the solution has a pure red color free from yellow. The cover is then removed and the liquid evaporated to the crystallizing point.

If, as may happen, the red chloride and the other salts crystallize out together, it is best to redissolve them by heat in a small quantity of water saturated with potassium chloride. The red salt then crystallizes out first.

Second Method. Alkaline Hyposulphites.

By reason of its great reducing powers a very small proportion of alkaline hyposulphite is capable of converting the yellow platinum salt to the red ; theoretically 1 part of hyposulphite should reduce nine or ten parts of platinum salt. We can hasten the operation somewhat by using an excess of hypophosphite, but then must work at a lower temperature. Both methods will be given.

In using an excess of hypophosphite it is convenient to take 10 grammes of platinum salt, 2 grammes, or even more, of potassium hypophosphite, and 600 c.c. of water. There are placed in a flask and very gently heated. The best temperature is 66 to 70 degrees Cent.

There is a very easy way of obtaining this temperature and of keeping it perfectly constant for any length of time, by taking an ordinary water stove of the kind in which a chamber is surrounded on five sides by water. Such a stove is to be furnished with a Kekulé constant level, regulated to keep the water jacket half full. If now the heat is turned on so as to keep the water gently boiling, it will be found that solutions placed on the top maintain a perfectly steady temperature, varying from 55 to 72 degrees Cent. according to the shape of the vessel, but constant for any one shape. The lowest temperature, about 55 degrees, is obtained with an open, flat porcelain basin It rises gradually as the shape of the vessel tends more to check evaporation. When a litre flask has about 2 inches of solution the temperature will remain steady at about 66 degrees, and this temperature is very suitable for the treatment just described.

Even with this excess of reducing agent ten or twelve hours will be required. The solution must not be allowed to evaporate to less than one-half its original bulk.

The completion of the operation is known by the solution showing a perfectly pure ruby red color. The slightest shade of orange indicates the presence of the yellow platinic salt. It is much safer to allow the solution to evaporate spontaneously. If evaporated by heat there is always a chance that the reduction may go too far.

There is not much to choose between these two methods. The first, with acid sulphite, is the safest, because there is no danger of carrying it too far. On the other hand in the second method the red salt separates more easily and completely in crystallizing.

On the whole the method which I prefer is to keep down the hypophosphite and use a higher temperature and longer heating. For this, a weighed quantity of platinum salt may be placed in a flask with 30 c.c. of water for each gramme of the salt, and a quantity of potassium hypophosphite equal in weight to $\frac{1}{9}$ of the platinum salt. The flask is to be placed in a water bath which is kept at 80 to 90 degrees Cent. In consequence of the small proportion of hypophosphite the action is slow, requiring about eighteen or twenty hours for complete conversion. No attention during this time is required, and the advantages are that the solution becomes sufficiently concentrated to crystallize on cooling and that the very small quantity of foreign matter introduced renders it easy to obtain a pure product.

At 100 degrees Cent. the reduction to red salt takes place in about fifteen minutes. This method is practicable, but requires great circumspection. If the boiling is continued a little too long, the solution suddenly turns brown ; the reduction has gone too far.

If a quick reduction is desired it is better to use an acid sulphite as a reducing agent and the following method gives satisfactory results. In a flask is placed 300 c.c. of water, 24 grammes of potassium platinic chloride, 12 grammes each of potassium acid sulphite and potassium chloride. Sodium acid sulphite should not be used. The introduction of sodium salts interferes with the crystallization ; not indeed with the first crop of crystals, but later. These are made to boil rapidly together for twenty-five minutes, reckoned from the time when actual boiling begins. The solution is allowed to cool, filtered if necessary, and placed in a large flat-bottomed glass or porcelain vessel. In a day or two the red salt will commence to form large crystals. The addition of the potassium chloride causes the red salt to crystallize out first.

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* From the *American Journal of Science*, Vol. XLVIII., November, 1894.

It has seemed worth while to give these methods in some detail because the red platinum salt is likely to find a constantly increasing use in photography, not only for platinum printing, but as a substitute for gold in toning. There is no doubt that platinum is a much better metal for toning silver prints than gold. Its tones are better and its action is much more reliable.

By all these methods this beautiful salt is obtained in fine ruby red prisms.

PROBABLE EXISTENCE OF A PLATINUM SUB-CHLORIDE.

If, in obtaining potassium platino-chloride with the aid of a hypophosphite in excess, the heat is continued after complete conversion to the red salt, the solution in a few minutes changes from red to dark brown. The substance which gives the solution this dark brown color exhibits the following properties.

It is very deliquescent and cannot be crystallized. There is no satisfactory method of separating it from the other substances in solution. An oxide of platinum appears to be precipitated by the addition of potash, and this precipitate, when freshly made, dissolves easily in hydrochloric acid; but if it is thrown on a filter and washed, almost the whole of it runs through. This difficulty, it is true, can be avoided by washing with a dilute solution of potassium chloride. But the precipitate after washing is no longer soluble in hydrochloric acid, except that the acid dissolves out a little protoxide derived from the red salt, some of which is apt to escape reduction.

The brown solution exhibits the following reactions:

Hydrochloric acid has no effect.

Nitric acid decolorizes it.

Potash produces a brown precipitate soluble in an excess of the precipitant.

Ammonia, a brown precipitate insoluble in an excess.

The solution itself is opaque by reason of its intense color. When largely diluted it is yellowish-brown and perfectly transparent.

From the method of obtaining this substance there seem to be only two possible explanations of its nature. First, that it is metallic platinum in a state of solution; this is decisively negatived by the reactions just described. Second, that it is a chloride containing less chlorine than platinous chloride; therefore a sub-chloride. If the precipitate obtained by potash could after washing be dissolved in hydrochloric acid, its constitution could easily be determined. But during the washing it seems to be converted into metallic platinum.

I have noticed that when a solution of the ruby red salt $2KCl. PtCl_2$ is spread on paper and exposed to sunlight it does not blacken but assumes a yellowish-brown color; it would seem therefore that light acts upon it much in the same way as a hypophosphite, reducing it probably to a sub-chloride. If the reduction was to metallic platinum this would be shown by the production of an intense blackness.

In all this, analogy with silver salts is unmistakable. Pure silver chloride is not reduced to metal by the action of light, for after exposure it yields nothing to nitric acid. Both metals seem to form sub-chlorides, the oxides corresponding to which are very unstable.

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PHOTO-ENGRAVING WITH SILVER SALTS.*

BY LEON WARNERKE.

THE process which I have to communicate is, I believe, but little known, although it is about fifteen years old. When it was originally introduced, the photo-engraving processes were not in vogue; but since that time mechanical printing processes having been brought to a great degree of perfection, greater attention has been given to the subject, and I think the time has come to give a full description of this process, which I have never done before. The process is based upon the following principle: a gelatine-silver emulsion is coated upon paper in a manner similar to the preparation of carbon tissue, except that a salt of silver (bromide or chloride, or a mixture) takes the place of the pigment; the sensitized paper is exposed behind a negative and developed with pyrogallol and ammonia (no other developing agent is suitable) whereupon the portions of the emulsion which have been acted upon by light and subsequently by the developer are rendered insoluble, and the unaffected parts can be removed by treatment with hot water as in the carbon process, the print being then in a condition to be used in the manner usual in the processes of photo-engraving. It can be applied equally well for either letterpress or copperplate printing. My method differs from the processes now in general use, in that no salts of chromium are employed, but salts of silver; and, secondly, because instead of a prepared metal plate being exposed behind the negative, and afterward developed with hot or cold water, in this case the paper tissue is exposed, developed with pyro and ammonia, and then transferred to the metal plate.

This mode of procedure permits the contact between the glass negative and the paper tissue to be secured much easier than between the glass negative and metal plate, and renders unnecessary the reversal of the negative.

As the ink used in copperplate or letterpress printing is not capable of producing half-tones in the finished picture, the tone gradation must be secured by some other means, and is generally secured by a system of dots or points of different size. There are several methods of producing this grain. One method very largely employed at the present time consists in taking the negative through a screen of finely ruled glass; a second is by dusting powdered asphalt upon the metal plate, and afterward developing the image upon the plate so prepared. For letterpress work, of course, a negative only is required, but if the copperplate process is employed the transparency must be a positive. For the purpose of this demonstration I propose to use a portrait of our President, having obtained, by his permission, an albumen print from Mr. H. S. Mendelssohn, the author of the portrait, from which I have made a negative through a screen produced by Levy, of America, and having one hundred and thirty-three lines to an inch. The screen consists of two plates, ruled each in different directions and cemented together so as to form practically one piece of glass; it is placed in the special carrier in the dark slide and in contact with it is placed a sensitive plate. I used the ordinary gelatino-bromide plates on this occasion, it was a plate prepared by Messrs. England—slow, but very clear.

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* Read before the Royal Photographic Society.

To illuminate the portrait, I used my favorite magnesium lamp, and I find that the interposition of the screen between the plate and the transparency increases the exposure necessary by about three times. For producing the negative, which I pass round for examination, 30 inches of magnesium ribbon were burnt, half on one side of the frame and half on the other, lens *f*/11. It is very important that the glass screen should be perfectly clean, as the network is so fine that the slightest dust upon it will render good results impossible.

I will now proceed to work the process. The negative which you have seen is placed in the printing frame, with a piece of the sensitized paper, and the metal plate is next prepared. I use a copper plate, but brass will do as well. I have succeeded in obtaining a fine surfaced copper plate requiring very little polishing, and which does not produce the "devils" which are sometimes met with in process work. Snakestone followed by charcoal is used for polishing the plate, which should be placed upon a board covered with thick felt to prevent slipping, and after the polished plate has been washed, it is ready for transfer. I now make the exposure by burning a sufficient length of magnesium ribbon (in this case about 4 inches, the negative being very clear) and develop with the following:

A

Water	100 parts
Pyrogallic acid	10 parts
Citric acid	1 part

B.

Water	100 parts
Ammonia	12 parts
Potassium bromide	4 parts

To develop, carefully measure 10 drops of A and 14 of B; add about 45 c c. of water. Wash the exposed tissue in order that the developing solution may flow freely over it, and apply the developer, mixing a fresh portion if it becomes discolored. If the development is prolonged, it is necessary after developing to neutralize the last trace of ammonia with acetic acid in weak solution, or the emulsion will be rendered too insoluble on the surface. The print being developed is squeezed into contact with the copper plate. It is a good plan to press in this stage for one instant in the copying press (not too strong).

At this stage the manipulations do not differ from those of the carbon process, except that the carbon tissue requires to remain for at least a quarter of an hour before development is proceeded with; in this case hot water is applied almost at once, and the paper removed, leaving the emulsion on the plate. The unaltered silver is then washed out with warm water (about 30 deg. C.) exactly as in the removal of the pigment in the carbon process. When this is completed the image is seen to be formed of very fine points, like needles, and they are swollen, and if they were dried slowly in this condition, little filaments would remain between them.

It is therefore requisite to cause these swollen points to shrink, and this is done by the application of alcohol first diluted with half of water and followed by the strong alcohol—ordinary methylated spirit will do. The plate is then ready for etching. It is better to allow the plate to remain for several hours to get thoroughly dry, as damp gelatine is easily affected by the etching solution.

A different class of grain is produced by the use of asphalt in the dusting box, the construction of which is shown in the print which I pass round, and a similar effect can be obtained by dusting the plate with asphalt powder from an indiarubber ball or bellows. The plate with the asphalt deposited upon it is placed upon a stove or heated over a flame in order to partially melt the asphalt and cement it to the plate.

The copper plate while heated changes color, and when it acquires a steel color the plate is in proper condition, and after the plate is cooled the image can be developed upon it. Observe that the image upon the plate is not fixed with hyposulphite of soda in the usual way, as the hypo dissolving the silver salt in the emulsion would silver the plate, which is not desirable. The etching is performed by solutions of sesquichloride of iron of different strengths, those which I use being respectively 45 degs., 43 degs., 40 degs., and 37 degs. Beaumé. The strongest solution is applied, first, for ten minutes, afterward the second and third for the same time, and finally the 37 degs. for fifteen minutes. The gelatine is removed from the surface with a solution of a caustic alkali and the plate is then finished and ready for printing from, except that it is sometimes necessary to remedy some imperfection or etch certain parts more deeply. The clichés which I shall show you and print from have not been treated in this way, but are just as they were etched when removed from the etching solution.

There is no absolute necessity to make a negative through the ruled screen. An ordinary negative can be taken, and the ruled screen on the film put in contact with it, and this printed on the argentic tissue and treated as previously described. In order to secure the utmost sharpness, no glass should be interposed between the negative and screen, or argentic tissue, and, for this reason, either the negative or the screen must be on the film.

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ANALYTICAL CHEMISTRY FOR PHOTOGRAPHERS.*

BY ERNEST BEST.

In introducing the subject of "Chemical Analysis" to you this evening, I think no apology is needed, for the subject is one which should have interest for all who practice photography, be it either for pleasure or for profit. It is needless for me to dwell upon the many advantages possessed by one who has the power of testing the materials with which his work is carried out or constructed. This power has been to a great extent looked upon as privileged only to those who possess a thorough knowledge of chemistry. This is an error which I hope to dispel and show you how one without previous knowledge of chemistry, but possessed of average intelligence and patience, may qualify himself for this subject. It is only my intention this evening to act as it were as a preface to the subject, and not to go into many of the minor details with which this subject abounds. My aim is not for this paper to take the place of the many excellent text-books on this subject, but just to arouse your interest in this branch of photography, which is one of the key-notes for those who desire to experiment and dip into the future of photographic manipulations.

Now a word as regards apparatus. Most of the articles required are in every-day use, and the few extras required do not need the proverbial long pocket to enable one to become possessed of them. The following apparatus will suffice for most work: Test tube stand, test tube brush, twelve test tubes, 5in.x½in., spirit lamp or Bunsen-burner, wash bottle, two small evaporating dishes, two glass funnels, one packet of filter paper, three inches of platinum wire, two convex watch glasses, one nest of small beakers, a small retort stand, one piece of charcoal, blow pipe, and sulphuretted hydrogen apparatus.

Then as to reagents. Most of those needed for this work are already on our work benches.

The following few practical notes will be found useful to those to whom this subject is new:

1. When adding a reagent to a solution, and an unknown precipitate is formed, be sure and add sufficient to ensure that the whole of that precipitate is thrown down.

2. Wash every precipitate twice by pouring water on the filter containing it.

3. Do not hurry, therefore, if a precipitate is not produced immediately you add the reagent. Some reactions are at once apparent, and others take some little time.

4. Always test an unknown substance for the base or metal first, and then for the acid which has combined with it. For example, in sodium chloride, the sodium is the base or metal and the chloride is from the hydrochloric acid which has combined with the metal.

5. Always confirm the result given by one reagent by testing with another reagent for the same substance. For example, in adding a solution of barium chloride to an unknown solution, you may get a precipitate soluble in hydrochloric acid, and yet it may not be a sulphite.

6. To test with borax beads: Place a little borax on the loop of your platinum wire and hold it in the bunsen flame; it will boil up and then fuse to clear glass. Now place a very little of the substance to be tested on the bead, heat it, and allow it to cool. Now notice the color of the bead. If the bead is too dark to make out the exact color, add more borax and heat again. Chromium gives an emerald green bead. uranium a yellow bead.

7. To make a platinum test wire: Take two inches of platinum wire, double it in half, twist together so as to leave a small loop at one end, mount the plain end on a small glass tube to form a handle, take a small test-tube, fit a cork, and make a hole in it to take the glass handle, fit the cork over the glass handle, half fill the tube with weak hydrochloric acid, now put a cork into the test-tube, and the wire is always clean and ready for use.

8. Flame tests: Hold the platinum wire in the flame until it ceases to give an intense yellow color; then place a little of the substance on the wire and hold it in the lower part of the flame. Sodium gives a powerful yellow color; potassium a pale lavender.

The first step in the analysis of an unknown substance is to dissolve about twenty grains of it in two ounces of distilled water If not soluble in water, then dissolve in hydrochloric acid, in nitric acid, or in aqua regia. Having dissolved our substance, our next step is to divide it up into one or more of the six groups. To do this, what are known as analytical tables are used. These six groups depend for their power of dividing a substance upon the fact that a certain definite reagent will always precipitate certain metals under definite conditions. These six groups are arranged as follow:

Group I.—Silver and lead precipitate as chlorides with hydrochloric acid.

Group II.—Mercury, platinum, and gold are precipitated as sulphides by the action of sulphuretted hydrogen.

Group III—Iron, aluminum, and chromium salts are precipitated as hydrates by the action of ammonium hydrate.

Group IV.—Uranium is precipitated as a sulphide by ammonium sulphide.

Group V.—There are no important metals used in photography precipitated in this group.

Group VI.—This group contains sodium, potassium, and ammonium, which three salts are all soluble in all the previous four groups.

After the unknown salts are separated into the above groups, the precipitates of the groups must be subdivided into their final division, directions for which are given in the detailed table at the end of this paper. The next step after having discovered the metals or bases is the detection of the acids. For these tests use fresh solution each time

1. Sulphuric acid and sulphates. Free sulphuric acid is distinguished from a sulphate by its charring action on cane sugar. On adding barium chloride to a sulphate a white precipitate insoluble in hydrochloric acid denotes sulphuric acid. To confirm, dry the precipitate, mix with fusing mixture, and heat on charcoal with the aid of blow-pipe for a few moments. Then take a little of the residue, powder it, and place it on a bright silver coin, add a drop of water, and a brown black stain will result.

2. Hydrochloric acid and chlorides. Add silver nitrate. A white precipitate, soluble in ammonia, turns violet if exposed to light, insoluble in nitric acid.

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* Read before the North Middlesex (England) Photographic Society

3. Nitric acid and nitrates. To a weak solution add equal bulk of a fresh solution of ferrous sulphate, hold the test tube slanting wise, and carefully pour down the inside of the tube strong sulphuric acid. After a few seconds, a brown ring will be formed at the junction of the two liquids. A little gentle shaking assists the formation.

4. Carbonates, when treated with hydrochloric acid, evolve carbon dioxides. If this gas is allowed to bubble through a solution of lime water, it will become milky, and a precipitate of calcium carbonate will result.

5. Bicarbonates or hydric carbonates give off carbon dioxide on boiling the solution; the solids dissolve in boiling water with effervescence.

6. Sulphurous acids and sulphites. Barium chloride gives a white precipitate soluble in hydrochloric acid. Place in a test tube some granulated zinc, add hydrochloric acid, let it effervesce. Then pour some of the solution to be tested into it. Sulphuretted hydrogen will be given off, which may be detected by the smell and its power of turning lead paper black.

7. Thiosulphate. On adding hydrochloric acid to a solution, a precipitate of sulphur with a smell of sulphur dioxide. Silver nitrate gives a white precipitate soluble in nitric acid; the precipitate is blackened on heating.

8. Bromides. On heating with sulphuric acid and black oxide of manganese, bromine is given off, which may be identified by its red color and its power of turning starch paper yellow; will also precipitate nitrate insoluble in weak nitric acid, but soluble in ammonia.

9. Iodides. Heat with sulphuric acid and manganese, as in test 8. Wet starch paper will be colored purple. It will also precipitate silver nitrate; it is almost insoluble in ammonia.

10. Ferrocyanides give with silver nitrate a white precipitate insoluble in nitric acid and ammonia.

11. Ferricyanides give with silver nitrate an orange red precipitate soluble in ammonia.

12. Cyanides, with silver nitrate, give a white precipitate insoluble in nitric acid and ammonia. Silver cyanide when heated to red heat is reduced to metallic silver.

13. Citric acid and citrates, when heated with sulphuric acid, will char, blacken, and give off a faint odor of burnt sugar, and afterward give off irritating fumes of sulphur dioxide.

14. Oxalic acid and oxalates. When the dry salt or a concentrated solution is heated in a test tube with sulphuric acid, carbonic oxide gas and carbonic acid are given off, the former of which will burn at the mouth of the tube with a blue flame. A solution of gold chloride is reduced to a metallic state on the addition of an oxalate.

<table>
<tr><td colspan="10">Dissolve salt in water or weak acid—add hydrochloric acid in excess.</td></tr>
<tr><td colspan="2">Precipitate.
Wash, boil, and filter.</td><td colspan="8">Filtrate.
Pass H_2S through the solution.</td></tr>
<tr><td rowspan="3">Precipitate.
Dissolve PPT with AmHO, and HNO_3, white PPT Silver Nitrate. The PPT becomes purple when exposed to daylight</td><td rowspan="3">Filtrate.
Add dilute H_2SO_4. white PPT of Lead sulphate, fuse with blow-pipe when globules of Metallic Lead are formed which mark paper.</td><td colspan="3">Precipitate.
Boil with hydrochloric acid and add HNO_3 drop by drop until PPT is dissolved—divide solution into three parts</td><td colspan="3">Precipitate.
Wash PPT, dry, fuse with $NaCO_3$ and KNO_3, boil in water and filter.</td><td colspan="2">Filtrate.
Add ammonium sulphite, water, and filter.</td></tr>
<tr><td>No. 1.</td><td>No. 2.</td><td>No. 3.</td><td>Precipitate.</td><td colspan="2">Filtrate.</td><td>Precipitate.</td><td>Filtrate.</td></tr>
<tr><td>Add stannum chloride white PPT, which turns gray. Mercuric Salts.</td><td>Boil with oxalic acid, PPT the metallic gold.</td><td>Evaporate down with ammonium chloride, PPT of ammonic platino-chloride.</td><td>Residue brown Iron, test original solution for ferrous or ferric salts.</td><td>Add NH_4Cl and heat, white PPT, Aluminium.</td><td>Add silver nitrate, red PPT, Chronium.</td><td>Black PPT, Uranium, borax bead yellow color.</td><td>Evaporate, heat till all fuming ceases, cool, and dissolve in very little water. Sodium, yellow flame, add platinic chloride and Alcohol, yellow PPT, Potassium. Test original solution for Ammonium.</td></tr>
</table>

Note.—PPT is an abreviation of Precipitate.

DRAGON'S BLOOD IN THE ENGRAVING PROCESS IN HALF-TONE.

BY HARRY W. POPE.

(*Translated from the Moniteur de la Photographic.*)

Dragon's blood is a red, resinous powder now employed in place of the old inking process.

The advantages derived by using this substance are, the rapidity of manipulation by which the work can be done and the great economy realized in the cost of making a fine engraving. In fact, with good negatives properly made, nothing else is necessary. By good negatives one understands those having the whites, or high-lights, plainly indicated, and intense blacks,—the latter being quite essential. If there are weak parts in the original, one should work them up on the plate with a soft lithographic pencil.

The proof is made by the albumen process in the usual manner, but it should be inked with a smooth roller, charged with transfer ink, in the following manner:

A polished and heated zinc plate is first inked until a perfectly even coating is formed, and over its heated surface the roller is passed.

One should bear in mind that, contrary to the method adopted in the ordinary process, it is necessary to have an ink coating quite thick and opaque.

This done, the plate is immersed in a tray full of water, and, after a period of a few minutes, gently rubbed with a bung of cotton until the image is developed. When this operation is well done the results are quite neat.

The plate is afterward dusted with a powder, consisting of a mixture of

Bitumen, powdered	2
Rosin, powdered	2
Dragon's blood	1

then heated until the powder is amalgamated with the ink, and, after cooling it under the tap, immerse for half a minute in

Water	2500 cubic cm.
Nitric Acid	32 cubic cm.

care being taken to rub the plate all the time with a brush; this must be done as regularly as possible in this and subsequent etching operations.

Presently, dry the plate and heat it well; let it cool then while the ink is still sticky; dust it again, melt the powder as said before and bite-in in the same bath, strengthened by the addition of 32 grammes of nitric acid, which makes 1:40 strong.

We now consider the plate as being thus numbered on its sides:

3

1 2

4

Heat the plate (preferably over a gas-stove) until the hand can no more stand contact with it; dust immediately with dragon's blood by means of a camel's-hair brush about 8 x 11 centimeters wide; brush the plate from the side No. 1 until clean; a very small heap of this powder will be retained against the sides of each line and of each dot.

Then heat the plate until the powder becomes adherent; cool the plate and repeat the operation from No. 2, then bite-in for two minutes. Dust and brush in the same manner from the sides 3 and 4; after which bite-in for two minutes again.

For the next time, instead of stopping at the second dusting, proceed in the four ways, heating, of course, between each dusting and brushing.

Now increase the strength of the bath with 64 grammes of acid, which brings it at 1 to 20, and bite-in from two to four minutes according to the depth of the hollows already obtained. Brush again and again, dust with dragon's blood in the four ways, then bite-in during four minutes, after which wash the heated plate with methylic alcohol, then with a solution of potash or of soda.

If the epaulement was too great (a fact not common, specially with beginners), ink the plate while it is warm with a smooth roller and bite-in afterward for two minutes in a bath of

Water	2500 cubic cm.
Nitric acid	64 grammes

The plate should now be finished.

OPENING OF NEW FACTORY OF WUESTNER'S NEW EAGLE DRY PLATE WORKS.

There is nothing succeeds like success we are told, and many instances constantly come before us. The success of the Wuestner plates has been so great that the old premises became of little use to enable the manufacturers to meet the constantly increasing demand; accordingly a new factory has been erected and the opening ceremony occurred on February 14th last.

The new factory is a solid brick building, being 100 feet long by 40 wide, with 3 stories and basement, and several outhouses. The boiler house is also a separate building, while the engine, and other machinery, are located in the basement of the main building. In this basement the raw glass is kept, where it is unpacked and examined, and then put in acid to take off the dirt and any greasy substance which may be on the glass, as is very often the case. After the glass has gone through three acids tanks it is placed in clear, running water, and is ready for being washed; this is done by a machine of their own construction. The glass is fed in at one of the machines, when it goes through a set of circular brushes, which scrub it thoroughly, after which it is perfectly rinsed off, and then gets its coating of substratum. All this is done with the assistance of two men, one to feed the machine, and the other to rack the plates as they come off the other end of the machine. With this machine 200 to 250 dozen are turned out per hour. After the substratum on the plates has dried they are ready for the final emulsion coating, which is also done by machinery, one man feeding the machine continually, while two men at the other end take off and rack the then finished plates The emulsion is put on the plate at a temperature of about 110, and by the time the plates get to the other end of the 16-foot machine the emulsion is perfectly set and solid. This machine coats from 48 to 60 perfectly even plates per minute. The plates are now left standing in the drying room to dry; this is also connected with a new invention of their own. In order to get perfectly clean and clear air they take the air through pipes from above the roof down into the cellar. Here the air is triple filtered and washed, then dried and pumped up into the drying rooms as fresh and clean and free from dust, or any other impurities, as it is possible to make it, thus making it possible to turn out plates without the slightest flaws or blemish on them. On top of the building is a tower in which revolving fans are located, having direct connection with the different dark rooms, and drawing out all the foul air; this enables them to coat and dry from 1,000 to 1,500 dozen 8 x 10 every day, and having every plate perfectly dry at 6 o'clock; the next day the plates are examined, cut to the different required sizes, and packed, without separators, 6 plates in a package, and two packages in a box, when they are sealed up and packed in wooden boxes, ready for shipment.

THE NEW EAGLE DRY-PLATE WORKS.

The works were in full operation on the opening day, and at least 300 visitors were present to see the making of dry plates in detail.

They had a large exhibit of work made on their plates in the office and all through the building. No better work was ever shown at any convention. We noticed the work of the following artists in the exhibit: Theo. C. Marceau, San Francisco and Indianapolis, nice collection of Paris panels, etc., etc., on ortho plates; Louis Thors, San Francisco, cabinets, Paris panels and interiors; H. Randall, Ann Arbor, fine selection of large work and combination pictures; B. L. H. Dabbs, nice work in 11x14 and 14x17; Wm Kuebler's work made an excellent exhibit and was composed of large size work; F. Gutekunst Co., a fine selection of life-size heads and some very artistic work on stripping plates; W. H. Rau, a nice selection of out-door work; W. H. Potter, Indianapolis, good cabinet and large work; Geo. E. Curtis, Niagara Falls, views of Falls,—these pictures were the best we ever saw of the Falls John Reid, Paterson, views and some very fine locomotives made on 25x30 plates; Frank Olds, Newark, mechanical work made on ortho non-halation plates; W. H. Hoffman, Savannah, a nice selection of cabinet work on orthochromatic plates.

We also noticed the fine work of Fredricks, Alman, Pach, Schaidner, and Robinson, New York. Sarony was also represented by cabinet work and some of his beautiful specimens of his chalk drawings which he had presented to Mr. Wuestner.

The Ilotype Co exhibited a fine collection of pictures made upon Eagle plates and printed on their well known paper.

W. A. Cooper, Brooklyn, had a fine selection of interiors made on ortho non-halation plates, also views and other work on ortho plates. D. H. Anderson, some very fine work on 20x24 plates, and his celebrated composition pictures,—one representing the Congress, held in Chicago, of the Cardinal, Bishops and Archbishops of the Catholic Church from the whole United States; another, the Army of the Potomac giving a banquet to the Count of Paris; and the third, the Generals of the Confederate Army, Jefferson Davis in the centre surrounded by all his Generals.

J. L. Breese had a very large and fine selection of his carbon work, consisting of copies from historical paintings, and portraits of Satolli, the apostolic delegate from Rome; also, the great singer, Mlle. Calvé.

The Dresden Albumen Fabrik sent a collection of their superb pictures printed on their new collodion printing-out paper.

Some beautiful work in natural colors was shown by Wm. Kurtz in his three-color printing process, and by Mr. E. Bierstadt in his chrome-albertype work.

Mexico and Havana were also well represented by N. E. Maceo y Hermano, Otero y Colominas, Enrique Martinez, and Gomez Carrera, all showing the good qualities of the E. E. (Eagle Equatorial) Plate.

After the visitors had inspected the works to their hearts' content, and were all satisfied with the perfect working order of the whole factory, they were ushered up to the skylight, where refreshments and lunch were served. Each and every visitor was also presented with a golden souvenir, with the trade mark, the American Eagle, inscribed on one side, and the opening of the factory on the other. Most of the visitors stayed until the midnight hour was striking, when all went home with light and happy thoughts at the enjoyable time they had.

Early in the morning the employees of the Eagle Dry Plate Works presented the ever genial Mr. Wuestner with a beautiful gold-headed cane, in commemoration of the day.

* * *

NOTES.

Sarah Bernhardt has been photographed over a thousand times. Her first portrait was taken in 1867.

Mr. John Carbutt says that he is responsible for the adoption of the present American standard size for lantern slides.

W. C. Koehnle.—It is with feelings of the deepest regret that we learn of the death of Mr. W. C. Koehnle, a photographer of rare promise and a valued contributor to The Photographic Times and to our "Annual."

Photo=Engravers should read the article by Mr. Carbutt in this issue of The Times, describing his new Process Plates, giving formula for developing, clearing bath, fixing bath, etc , etc.

The Messiah Home for Children proposes to hold an exhibition of babies' photographs at the rooms of the Society of Amateur Photographers of New York, on April 4th, 5th and 6th. Thirty-eight handsome medals are to be awarded.

The Society of Amateur Photographers of New York.—The opening of the Members' Exhibition of this Society has been postponed to Monday evening, March 18th inst. The exhibition will open on that evening with a private view to members and the press.

"The Practical Photographer," for March, will contain an article on the life and work of the veteran photographer, H. P. Robinson, illustrated with reproductions of many of his best pictures. W. P. Buchanan, of 1226 Arch Street, Philadelphia, is the American agent for this publication.

P. A. of A.—At a recent meeting held by this Association the date of holding the 1895 Convention was fixed from August 6th to the 9th inclusive. Full particulars, together with a list of the numerous prizes offered, can be obtained from the Secretary, Mr. E. M. Hayes, 246 Woodward Avenue, Detroit, Mich.

The Mystic Camera Club of Medford, Mass., will hold their annual exhibition from April 19th to 24th inclusive. All entries must be in the hands of the Executive Board before March 25th. An annual outing will be held at Annisquam, Mass., in the form of a basket picnic of members with their ladies and friends.

M. J. Richard says that on shipboard he washes his prints with sea water, by throwing them overboard in a pail or tub, secured by a strong rope and letting them "tow along" thus for a certain time, afterward rinsing them with fresh water, and lastly with 50 per cent. alcohol, after which they dry rapidly.

Dr. Elmendorf delivered a most entertaining lecture before the members of the Photographic Section of the American Institute. "A Trip to the Alps" was the title of his lecture, and it was illustrated with some very beautiful slides of Alpine scenery. Most interesting, however, were the photographs taken by Dr. Elmendorf with his Dallmeyer tele-photo lens.

Minneapolis can boast of a young ladies' camera club. The Secretary is M. Eva McIntyre, 1833 Portland Ave. On March 6th, Miss Kabybell Chadburn related some of her camera experiences in Holland, Japan and other countries, and Miss Minerva Turnbull gave incidents of snap shots among the Alaskans, also in California and the Yellowstone.

A New Camera Club has been formed at Portland, Oregon, called the Oregon Camera Club. It is a healthy infant seven months old, 35 members, and steadily growing. The officers are: President, A. Anderson; Vice-President, Dr. Frank E. Ferris; Secretary, J. A. Hertzman; Treasurer, W. H. Chapin. All communications should be addressed to the Secretary, care of First National Bank.

Messrs. Willis & Clements are introducing a new rough surface cold bath Platinotype Paper, which is very artistic in its effects both for portraits and landscapes. It is spoken of in the highest terms by such photographers as Sarony, Davis and Sandford, Julius Strauss of St. Louis, and Frederick Hollyer of London, England.

On receipt of 25 cts. a sample print on this rough paper will be sent by Messrs. Willis & Clements, 1624 Chestnut Street, Philadelphia, Pa.

Cameras are Barred.—In the House the bill to permit the use of photography to prevent and detect false impersonation of voters was killed. Mr. Whittaker, of Wrentham, argued that if persons with a camera were stationed at the polls they might obstruct the election, and, being there by the authority of law, they would refuse to get out of the way. Mr. Bliss replied that the plan was perfectly feasible, and would do much to prevent false impersonation. The bill was rejected by a vote of 58 to 77. A roll call resulted in 78.

"Photographische Rundschau."—The January number of this magazine publishes an interesting article on the photography of a drop of water during its fall. The article is extremely interesting but of such a nature that it is impossible to condense it for our columns and retain the important points. A reproduction of the results obtained is printed, and we refer our readers to the original article, the author of which is Herr Hans Schmidt, a student of engineering at Munich.

Lieut. Col. C. A. Park.—We regret to have to record the death of Lt. Col. Charles A. Park. Col. Park, when a young man not 17 years of age, learned the art of the daguerreotype from his brother-in-law, Mr. Jas. F. Ryder, the well-known Cleveland photographic artist. On the war breaking out he enlisted in the 8th O. V. I., and for his gallant deeds soon became lieutenant-colonel. After the war he resumed his old occupation of photographer, and established a sound and lucrative business, first in Elyria and afterward in Norwalk.

A Return to the Daguerreotype.—We hear from Chicago that there is quite an interest reviving in the old daguerreotype process.

Mr. Alex. Bessler, the veteran photographer (probably the oldest daguerreotypist in this country), has been importuned by a number of capitalists to resume the practice of making daguerreotypes on a large scale, and in the best possible manner.

Mr. Steffens, the society photographer of Chicago, is also forming plans of introducing something of the same sort.

A Floating Studio.—Mr. M. J. Steffens, the well-known photographer of Chicago, has been in New York selecting an outfit for the elegant floating studio in his new steam yacht, "Laura S." The camera will be made by the American Optical Company and fitted with two of the genuine Zeiss lenses. Mr. Steffens is the first photographer, so far as we know, to fit up a photographic studio in a yacht. This yacht, by the way, was made specially to order for Mr. Steffens, after the most approved patterns. Its headquarters are at Chicago, of course, but it was built for salt water as well, and Mr. Steffens expects to make an extended cruise in it during the coming summer along the shores of the Atlantic.

Studying Clouds by Photography.—In compliance with a request received in December from the International Meteorological Society, Chief Harrington, of the Weather Bureau, has appointed Professor Martin, Mr. Henry and Mr. McAdie, three of his assistants, to arrange for a series of cloud observations to be made throughout the world during the year commencing May 1, 1896. A careful study of this subject has long been pending on the scientific calendar, for meteorologists agree that clouds, although the most conspicuous, are the least understood of all the elements consulted for their daily predictions.

The photographic camera is to be the principal factor in the work. All of the results recorded in this country are to be illustrated by photographs, which will be taken continually during the experiments.

A German exchange gives the following receipt for a good cement for porcelain, china, etc: Mix 20 grammes of gelatine with an equal weight of glacial acetic acid, dissolve by heat and evaporate to a syruppy consistency so that when cold the mixture will be about as stiff as jelly.

For use, the mixture should be warmed until fluid, the edges of the fracture covered with a camel's-hair brush and the pieces bound together with a thread or otherwise until dry.

Toning Without Gold.—At a recent meeting of the Gironde Photographic Society was mentioned a rather happy instance of toning without gold, the credit of which is due to Mr. Suret, of Libourne. On removing the print from the frame Mr. Suret plunged it into a solution of common salt until it changed to a handsome red color. After washing and fixing in hyposulphite, this tint changed to an orange red, and after a new washing and fixing regained its original color. The tone thus obtained is not altered by sunlight. Several prints obtained in this manner, and exposed for a long time to the sun, are said not to have altered.—*L'Amateur Photograph.*

Honors for Americans.—At the International Exhibition of the Photographic Society of India, held at Calcutta during the month of February, the following were the awards to American exhibitors:

Landscape: Silver medals to Alfred Steiglitz for "Early Morn," and to Rudolf Eickemeyer, Jr., for "After the Rain."

Bronze medals to W. B. Post for "Winter in the Park," and to W. W. Jackson for "Ouray, Colorado."

Genre Pictures and Studies: Silver medal to Miss E. J. Farnsworth for "La Cigale"; honorable mention to C. B. Moore for "Marbles"

Special medal presented by His Excellency the Viceroy of India for the best picture in the exhibition, awarded to R. Eickemeyer, Jr., for "The Kittens' Breakfast."

An International Prize Competition and Summer Photographic Exhibition will be held, Arcade Galleries, Royal Agricultural Hall, London, N., England, from June 29th to July 6th, 1895.

We understand that, owing to the fact that the majority of photographic competitions and exhibitions are held during the autumn and winter months, when small society competitions clash one with the other, it has been decided to hold the above in June, 1895.[*]

Handsome medals and other prizes will be placed in the hands of the judges, with which to reward meritorious work. Owing to the space being limited, there will be a selection committee, and therefore acceptance and hanging of any picture will in itself be an honor.

The great feature of the exhibition is that the prints need not be framed, thus doing away with the expense of frames, railway carriage, etc., the only outlay being postage and the entrance fee of one shilling per print.

Special efforts will be made to obtain representative exhibits from Australia, India, New Zealand, America,

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[*] This Exhibition will run concurrently with "The International Tobacco Trades' Exhibition," to be held on the above dates.

Japan, France, Germany, Belgium, Holland, etc., and photographers abroad are earnestly invited to compete

Prospectuses and full details will be ready shortly, and will be sent upon receipt of name and address. The entries close and exhibits must be received not later than June 10, 1895.

Further particulars can be obtained by addressing Walter D. Welford, 59 and 60 Chancery Lane, E.C.

Two New Cameras.—We redescribed on page 176 of the March number of our magazine, namely: The New Waterbury and Henry Clay, 2d, both made at the works of the well-known American Optical Company.

Both these cameras have since been considerably improved, as we find by examining the new cameras which the manufacturers have sent to us for the purpose.

"The New Waterbury" is now made with two finders instead of one, as described in article referred to, but retains all the other advantages, of three double dry-plate holders, safety shutter, etc., etc. Price also remains the same, namely, $15,00.

The "Henry Clay, 2d," has not only been still further improved, but the price has been reduced from $20.00 to $15.00. The front is now made so it can be raised and lowered; there are three double dry-plate holders included with the camera, and are carried at the back instead of two; and the front board and finder are made of polished mahogany instead of ebonized wood. The same safety shutter, with pneumatice release, is retained, and the same excellent working lens.

The American Optical Company evidently proposes to retain their leadership in the manufacture of cameras, both the cheaper ones as well as those that are more expensive.

Complete descriptions of both these cameras can be obtained by sending to the manufacturers for them.

Photomicrograph versus Microphotograph.—The confusion of the terms "photomicrograph" and "microphotograph" has led Mr. A. Clifford Mercer, the well known photomicroscopist, to try to discover the paternity and original meaning of the more important word, photomicrograph.

During the past eighteen months, through the kind interest of Dr. R. L. Maddox himself, and through him of the editors of the *British Journal of Photography*, the looked-for paternity has been discovored. Traced to Mr. George Shadbolt, he has acknowledged the child, writing: "I believe I am responsible for drawing attention to the necessity of a distinction between a photographic picture of an enlarged object, and the minute photographic picture of a large object, the former being correctly described as a 'photomicrograph' and the latter as a 'microphotograph,' in accordance with the meaning of the original Greek derivatives. This will have been in an early number of the *British Journal of Photography*, probably while it was still called '*The Liverpool Journal of Photography.*'"

The exact date of the birth of the word is still somewhat doubtful, but Dr. Maddox writes: "I think we may safely put it at '59 or '60, although we cannot put our finger on the page even after much research."

The two acknowledged leaders in photomicrographic literature in the two great English speaking countries, Drs. Maddox and Woodward, throughout their writings have used the words in question with the clearly defined Shadbolt distinction; and the writer trusts, with this historical note recorded in our proceedings, the American Society of Microscopists, as a body and as individuals, will insist upon the correct usage of these terms.

A photomicrograph is a macroscopic photograph of a microscopic object; a microphotograph is a microscopic photograph of a macroscopic object. The latter has been in miniature opera glasses as a microscopic photograph of Niagara Falls, or other objects of interest to sight-seers.

The Cyanotype Process.—At a recent meeting of the Photographic Society of Japan, Mr. K. Nakahara showed a cyanotype print, much superior to anything of the kind generally seen. It was from a mechanical drawing, line sectioned, and showed deep black clear lines on a perfectly white ground. Mr. Nakahara described the precautions necessary to get this effect, and the difficulties that were likely to be met with. Briefly put, the process is as follows:

A paper highly sized should be used. Small sheets can easily be worked, but the difficulty increases greatly with dimensions, a sheet about 20 x 18 being the largest that he had, so far, been able successfully to manipulate. Want of equality in the depth of the lines, and staining in the whites are the defects difficult to overcome. All manipulations are with a view to avoid these.

The sensitizing solution is as follows:

Gum arabic	15 grammes
Water	110 c.c.
Tartaric acid	2 grammes
Chloride of sodium (common salt)	9 grammes
Sulphate of iron	10 grammes
Iron perchloride	15 grammes

In mixing the solution, the gum arabic is first dissolved in the water by the aid of heat, and the other salts are added while the solution is still warm.

The solution is spread over the surface of the paper with a sponge, and after allowing a little time for it to penetrate the surface all superfluous moisture is removed, using the sponge again, well wrung out. If this precaution be not attended to, the depth of the lines is not equal. The paper is then dried as quickly as possible. If the drying is not rapid, the whites stain.

Exposure is somewhat longer than would be needed with sensitized albumenized paper. The color of the sensitized paper is yellow. During exposure, all but the lines turns to white.

Development is by a plain aqueous solution of gallic acid, the strength of which is not important. Care must be taken not to leave the print too long in the developer, otherwise staining will result. After development the print is rapidly washed, when superfluous moisture is carefully sponged off the surface. If this precaution be not observed inequality in the depth of the lines will result.

The success of the process would appear greatly to depend on the sponging off of superfluous sensitizing solution and water from the surface of the paper, and on quick drying after sensitizing.

20,000 Goerz Lenses.—The optical factory of C. P. Goerz (the maker of the celebrated Double Anastigmats) has just completed the twentieth thousand photographic lens made at the works. Mr. C. P. Goerz will visit America some time later to arrange for the active introduction of the Anastigmats among photographic workers here. We are informed that a new and complete catalogue of the Goerz lenses is now ready and may be had on application to the American office, C. P. Goerz, 52 Union Square, East, New York.

Bogardusiana.—Some sitters would endure with patience the long sittings required for a picture during the early days of the Daguerreotype; others would consider it a great hardship. One old gentleman, the head of a large dry-goods house, wished twelve pictures for his children and friends; *of course he must sit twelve times*. He seemed to get along very well for the first five or six, but he became *sleepy*, and we had to *wake him up* at every subsequent sitting.

We always kept sticking wax to keep wing-shaped ears from standing out from the head, and often used a wad of cotton to *fill out* hollow cheeks. The ladies called them *plumpers*.

The best advice I ever heard as to expression was from a country girl to her intended. She said, "Now, Josh, kinder smile and kinder don't."

The door is slowly opened, and an old colored man modestly enters, taking his hat off, and making a low bow. He wants his "telegraph taken widout no hat on."

A boy and his sister sit for a group; as they come from behind the screen the boy asks, "Does it make any difference if you rub your nose?" He is told it does. "But why did you do it?" "Because a fly was walking over my nose and I brushed him off."

A man once told me his picture looked like the devil I told him I could not say as to the likeness, as I had not seen that personage, but sometimes a resemblance ran all through families.

Pat brought a small case, and said he wantedhis picture in it life size. He was told the box was too small to hold a life-sized picture. He stood a minute and said "Then take it with the legs hanging down."

A countryman went out to get his boots blackened, as he was to have a head taken for a locket.

An old lady called out in the middle of a sitting, "Stop it, stop it, I winked."

In one of the city galleries the proprietor had a showcase in which he exhibited pictures which the sitters failed to call for. He labeled it, "Shades of the departed."

A letter from Wisconsin asks me to send the writer the pictures of Queen Victoria and all her daughters if I have them. He is told that she had not been in lately, but the first time she was in with the girls he should receive them, if they had their best clothes on and were willing to sit.

On showing a husband the proofs of his wife's picture the operator threw one aside, saying it would not do, as she had allowed the end of her tongue to show. Let me see it said the man; I did not know there was any end to it.

A photographer advertised to take deceased persons at their residences. He might find it difficult, as chemicals do not work well in hot climates.

A mother brought a bouncing baby for a picture. As the operator came out of the dark-room with his plate she was spanking the baby. He remonstrated with her, as she would spoil the impression. She said it was color she was after, as he always had such a good color after being well spanked.

A lady said she wished to be taken two ways, "standin her hat and sitting in her cap." As you please, but it is not usual for ladies to stand in their bonnets, and it would ruin your cap to sit in it.

A Frenchman, having received the photograph of a lady, inquired, what was usual under the circumstances. He was told to compliment it, and say its beauty was very rare. "I beg to make the acknowledgment, madame, zee beauty is very scarce."

"You will take my picture easy," said a husband, "but my wife cannot stop talking long enough to have hers."

As a boy with red hair goes behind the screen, his father says, "Now, Mike, stand straight, and hold aisy while the gentleman draws yer picter; you'll not be taken wid a black head anyway."

The operator arranges two chairs for an engaged couple; the gentleman suggests that one chair will be sufficient.

Stout people always wanted to be taken a little thinner, as they were stouter than usual just then. Thin people always wanted to be taken a little stouter, as they were thinner than usual just then. Large people wanted to look smaller, and small men always wanted to be taken to look large.

Homely men wanted to look handsome. Homely women, well, we didn't have any. Somebody has said, "There is no woman so homely as not to be a pink in somebody's eye."

A husband said "he did not expect a handsome picture of his wife; he did not marry her for her beauty, but because she was good." The wife retaliates by saying she did marry him for his good looks, but they did not wear well; all faded out in the first washing.

A man had gone into politics, and his picture came out in a newspaper. On seeing it his wife began to cry. He asked her why she cried. She said, "If I had known you looked like that I never would have married you."

It is said that a French woman on cleaning a fish discovered the likeness of the fisherman in one of the eyes of the fish. Like other fish stories, this needs confirmation.

An old lady on being told to look at a bird on a stand said, "La, sus, I thought I must look in the spout."

General Logan had several sittings, and on looking at the pictures on the walls, saw a man of considerable notoriety who had swindled him in a business transaction. He said, "I suppose you take any and everybody as they come along, and would take the devil if he would sell." I told him that was so; and I supposed "old Beelze" would sell well around Washington. The General said, "That's the place to sell him."—*St. Louis and Canadian Photographer.*

THE EDITORIAL TABLE

Reviews of Books, Photographs, Apparatus, etc. Received

We have received from Professor Karl Klauser, of Birmingham, Conn., copy of a musical work entitled "Half-Hours with the best Composers," illustrated by portraits of prominent American composers. The work is an excellent one throughout, and should be widely appreciated by musicians and music lovers.

Gold and Silver Lacquer Photographs.—From Mr. H. Mizuno, of Fudoushita Ota, Yokohama, Japan, we have seen some very beautiful specimens of Japanese work in which photography is employed. Photographs on silver and gold are made upon Japanese lacquer work and are remarkably effective. The results are said to be indestructible Mr. Mizuno should have no difficulty in disposing of these articles. The photographs are chiefly of Japanese scenery, but copies can be made from any pictures sent in. The Scovill & Adams Co. are agents for these goods.

Royal Handbook of Popular Science. By John Gall. New York : T. Nelson & Sons..

In this handy little volume the author endeavors to bring together in a form which admits of easy reference a manual of useful information on various branches of science. Without a doubt he has succeeded. It is well up to date and clearly written, without the employment of difficult technical terms. A great deal of space is devoted to optical and chemical terms, and a careful study of these is recommended to the photographic student.

Der Platindruck. Von Freiherrn von Hübl. Halle a/S.: Wilhelm Knapp.

This work forms part 13 of the "Encyklopädie der Photographie," and deals entirely with the platinotype processes. Like all the other parts of this admirable book the subject is handled by a master. The various methods of printing with platinum salts are described and all the very latest improvements detailed.

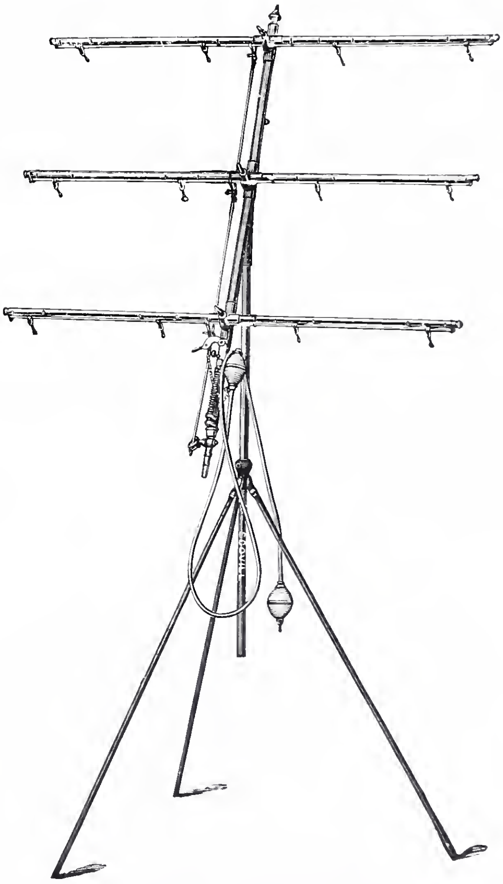
Die Photolithographie. Von George Fritz. Halle a/S.: Wilhelm Knapp.

The author of this work is one of the chief directors of the Government Printing Bureau in Vienna, and is well qualified to deal with the subject of photolithography, which is practiced to such a great extent in Germany. Besides a complete account of the process, the book contains a large number of photolithographic reproductions in various styles. The work forms part 11 of the "Encyklopädie der Photographie."

Lantern Slides—Their Production and Use. By J Pike. London : Messrs. P. Lund & Co., Memorial Hall, E. C. Price, 6d.

In this little work the author bears upon the various methods of making lantern slides by the wet and dry processes, and by contact and development, intensification, printing in clouds, and toning. A method of making lantern slides by the carbon process is also given. The subject is well handled and should be a useful guide to those contemplating this kind of photographic work.

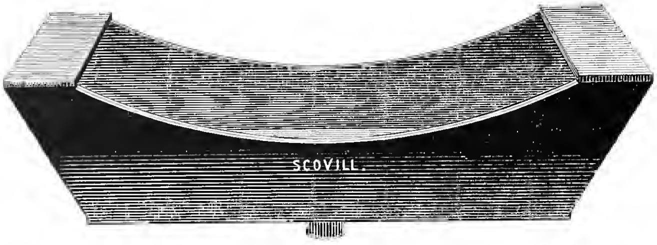
Hunter's Flash-Light Apparatus.—In our last issue we gave particulars of this apparatus, with some excellent samples of flash-light work produced by its aid. We give herewith a cut of the apparatus in order to point out the compactness of the arrangement. It will be noticed that there are only 12 pans to be filled, a great convenience and saving in cost of magnesium, and yet by an



HUNTER BROS'. FLASH-LIGHT APPARATUS.

ingenious arrangement the light is just as intense, and as evenly distributed, as in other apparatus costing several times as much, and two or three times the size. As stated in our last, the machine here described can be obtained from any photographic dealer.

A Photo-etching Tub.—It is evident that as photo-engraving progresses in the way of perfection in the means employed to obtain the best results, it is necessary that the improvement in the apparatus and accessories should keep the same pace, for this branch of the photographic art being mainly mechanical, depends largely for its success on the tools used. It is gratifying therefore to note the systematic manner in which the Scovill & Adams Co. have undertaken to meet the requirements in photo-engraving appliances. Some time ago we had occasion to refer to their Photo-engraving Adjustable Screen Plate Holder—at present universally in use—and, later, to their accurately adjusted Photo-engraving Printing Frames, and now we give an illustration of their Photo-engraving-etching Tub.



The manufacturers claim that this tub is constructed so as to resist the strongest acids, and that it combines the necessary features suggested by practical experience. We believe that photo-engravers will welcome this new effort of the enterprising Company.

Photogravure, by H. R. Blaney. New York: The Scovill & Adams Co., 423 Broome Street, N. Y.

Photogravure is a process that has been admired by every one as the most perfect of all. It gives the most artistic results; it is inexpensive when any number are required, and any color desired can be used.

Many, however, imagine it to be a process far away from the reach of the amateur photographer, and requiring all sorts of things, and an expensive outlay.

Mr. Blaney, in his work, gives a clear and practical description of the process, and a careful study of it with a little practice will enable any amateur or professional photographer to make his own photogravure plates from which any number of impressions can be pulled at a very small cost.

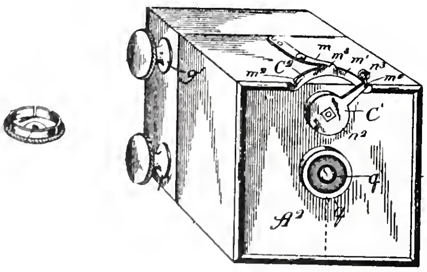
There can be little doubt that the book will have a very large sale, as the instructions given are from a practical man who has made a name by his superb photogravure work. The contents of the work are as follows:

INTRODUCTION BY THE EDITOR. Early History of Photogravure. Woodbury's Process. Other Methods. CHAPTER I.—The Negative. Quality Best Suitable. Necessaries for Reversing. Methods of Obtaining Reversals. The Powder Process. CHAPTER II.—The Transparency. The Carbon Process. Cutting up the Tissue. Sensitizing. Drying Exposing. Continuing Action of Light. Development. Carbutt's Transparency Plates. CHAPTER III.—The Carbon Tissue. Sensitizing and Exposing. The Actinometer. CHAPTER IV.—Cleaning and Graining of the Copper Plate. Grade of Copper Necessary. Where and How to Buy It. CHAPTER V.—Development of Negative Resist on the Copper Plate. Preparation for Biting with Acid Through the Gelatine. CHAPTER VI.—The Acid Baths. How to Make Them and Method of Biting Through the Gelatine. CHAPTER VII.—Cleaning and Polishing the Plate, with Tools Necessary for Retouching. CHAPTER VIII.—Printing from the Plate. Steel Facing. CHAPTER IX.—Materials Necessary for Photogravure. List of Firms Supplying Them. CHAPTER X.—Books and Articles on Photogravure, 1888-1893.

PHOTOGRAPHIC PATENTS.

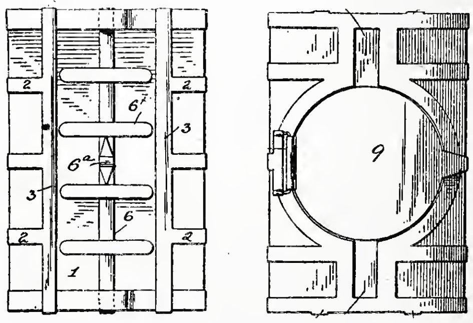
No. 533,618. **Roll-holding Camera.** Christian H. Stoelting, Chicago, Ill., Assignor to Alfred C. Kemper, Chicago.

This invention relates to improvements in pocket cameras, in which photographic negatives are made upon a slip of sensitized films, the object being to provide a camera of a size so small that it may be conveniently carried in the pocket and at the same time be a highly effective and desirable device for the purpose.



533,752. **Photographic Print Holder.** Henry A. Stimson and Chas. Isaacson, South Superior, Wis.

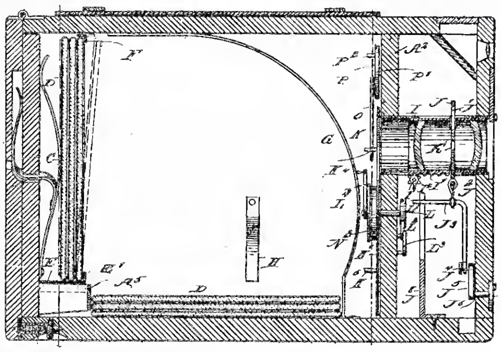
The object here is to provide a holder for prints which will permit of their being readily placed thereon and removed therefrom, and will hold them securely against curling when in the toning bath. It consists of a base plate having an open centre for the introduction or removal of the prints made in such a manner as to permit all parts of the image to be observed by the operator, and to allow the toning bath and washing water to reach over the whole.



534,115. Magazine Camera. Albert Sundelieu, Port Jervis, N. Y.

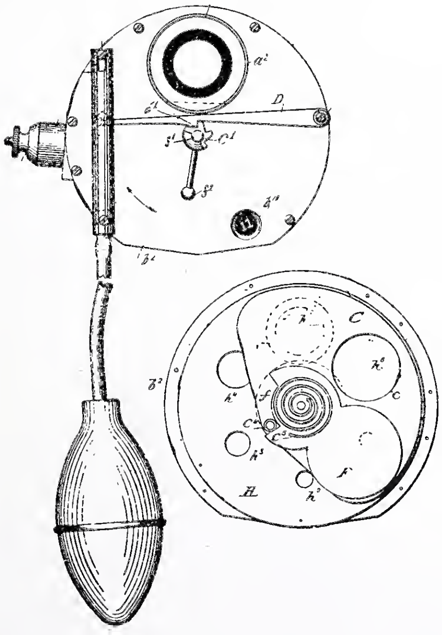
The object of the invention is to provide a new and improved combined magazine camera for plates or films.

Claim is made for a hand camera comprising a plate-rest extending transversely and secured in the camera casing, the said plate-rest being adapted to receive the lower edges of the plate carriers, an L-shaped abutment extending transversely and mounted to turn in the casing, the said abutment being adapted to be engaged by the upper ends of the plate carriers to hold the latter in a vertical position during exposure, a spring pressing on the back of the rearmost plate carrier to force the several plate carriers forward on the turning abutment, and an indicator controlled by the said spring to indicate the number of plates exposed.



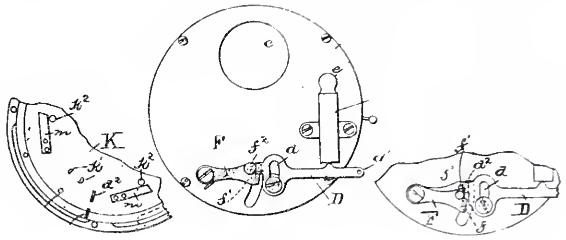
534,337. Photographic Shutter. Franz J. Mathern, New Haven, Conn., Assignor to the Scovill & Adams Co., New York.

In this invention claim is made for the combination, with a lens tube, of a shutter having an opening capable of being moved past the lens tube, an auxiliary shutter for covering the opening of said shutter, a support for the shutter, a spring applied to the auxiliary shutter for operating both shutters, a pin or stud having the auxiliary shutter affixed to it and extending through the shutter support to serve as a means for setting the shutter, a hub on the shutter and a spring-actuated detent for engaging with the hub on the shutter, said detent serving to hold the shutter against movement during the setting of the shutter until after the auxiliary shutter shall have moved far enough to cover the opening of said shutter, substantially as specified.



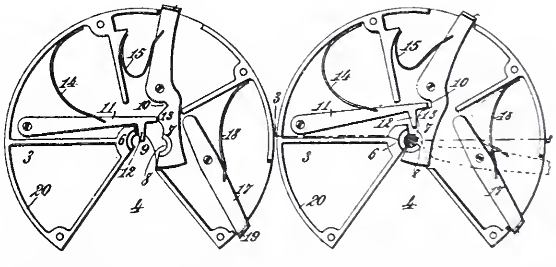
No. 534,440. Photographic Shutter. Fred H. Kelley, Boston, Mass.

Claim.—A camera-shutter comprising in its construction a suitably apertured casing, a shutter-disk rotatively supported in said casing and having an aperture for registry with those of the casing, said disk carrying a crank-pin and stop-pins; a slotted arm engaging said crank-pin and pivoted to the casing; a spring rod or wire pivoted to the casing intermediate of its ends and having one end in engagement with the said slotted arm and the other end projecting from the casing, the latter having provision for engagement of the spring when put under tension; and a detent for engagement with the stop-pins on the disk.



534,912. Tripod or Camera Support. Enoch W. Perry, Jr., New York, N. Y.

The combination with a camera or other object, a supporting stand, and a pin, bolt or button on one of said parts, of an automatic locking mechanism mounted on the other one of said parts and comprising a fixed jaw, a movable locking jaw, and a spring-pressed trigger to normally hold open the said movable jaw and having a tongue adapted to project in position to be pressed against by said pin, bolt or button, the said movable jaw being provided with a recess to receive the free end of the trigger as it is forced back by the entering pin, bolt or button, whereby the trigger is caused to release the movable jaw and permit engagement of the said pin, bolt or button, by the jaws of the automatic locking mechanism.



OUR QUARTERLY COMPETITION.

No. 5.—GENRE STUDIES.

For the best genre photographs we offer the following :

First Prize : A Silver Medal and Photographic Times Certificate of Merit.

Second Prize : A Bronze Medal and Photographic Times Certificate of Merit.

Third Prize : A Bronze Medal and Photographic Times Certificate of Merit.

Photographic Times Certificates will also be awarded to three other competitors, to be decided by the judges, if the work be sufficiently meritorious.

RULES.

Rule 1.—All entries must be forwarded to Editor Photographic Times, 423 Broome Street, New York, and marked "Competition."

Rule 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and the coupon to be found upon one of the advertisement pages should be cut out and filled in with name and address, together with a few particulars regarding the photograph and any other details of interest, and inserted in a sealed envelope, upon the outside of which the *nom de plume* must be clearly repeated.

Rule 3.—The competition to be an open one. Any number of pictures may be sent, but each one must be accompanied by a coupon and a different *nom de plume* used in each case.

Rule 4.—All pictures for competition must be sent prepaid.

Rule 5.—The whole of the work entered must be the work of the competitor—that is to say, the exposure, development, printing, toning, mounting and finishing.

Rule 6.—The prints must be mounted. Framing optional.

Notes.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious The possession of a Photographic Times Medal will, therefore, be a guarantee of a high order of merit.

The editor reserves the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competion will not be returnable.

The last day for receiving entries will be March 31. The awards will be announced as soon after as possible.

SPECIAL LANTERN-SLIDE COMPETITION.

For the best set of six lantern slides we offer one silver and one bronze medal in each of the following classes :

I. Landscapes.
II. Marine pictures.
III. Genre studies.
IV. Scientific subjects.
V. Architecture.
VI. Portraiture.

RULES.

Rule 1.—Entries may be made in any or all of the different classes, and must consist of six slides for each set entered, sent prepaid.

Rule 2.—Both the original negatives and the slides must be the entire work of the competitor.

Rule 3.—No competitor will receive more than one prize in any single class.

Rule 4.—The coupon to be found in the advertising pages must be filled up and sent with the slides.

Rule 5.—The size of the slides should be 3¼ x 4, or 3¼ x 3¼. When viewing the picture in its natural position the label containing the title must be to the right, and the thumb label on the lower left hand corner.

Rule 6.—Sets receiving the awards will become the property of The Photographic Times, and will be loaned to the principal photographic societies. The remainder will be returned at the expense of the competitors, *if so desired in writing.*

This competition will be closed on the 30th day of June, 1895.

$25 CASH PRIZE

will be given for the best description of the modern process of half-tone engraving by the enamel method. Articles must be sent to the Editor before the end of May, and should not be more than 4,000 words in length. The unsuccessful manuscripts will be returned if stamps be enclosed for that purpose. The prize will be given for the clearest and most practical article. Illustrations can be sent where necessary. Sketches or photographs will answer the purpose. Address, Editor The Photographic Times, 423 Broome St., New York City, N. Y.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

Edited by
WALTER E. WOODBURY.

Subscription Rates.

For one year	$4 00
" six months	2 00
Three months' trial	1 00

Single copy, 35 cents.

On Foreign Subscriptions $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to The Photographic Times received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries." etc., should be addressed to The Editor; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
W. I. LINCOLN ADAMS, Manager,
423 Broome Street, New York.
LONDON: JONATHAN FALLOWFIELD,
146 Charing Cross Road, W.

ITEMS OF INTEREST.

"**Annual.**"—It is a complete treasure.—Dr. Johannes Meiner.

"**Annual.**"—It is a good one this time, about the best out as yet.—A. R. Dresser.

I most heartily congratulate you on the really splendid "get up" of your Times. I have seen nothing like it hitherto.—Lafayette.

It is a splendid book. The richest and best, I think, of the whole series—and I have all the "Annuals" from the first.—Prof. Geo. Kennedy.

"'**The American Annual of Photography**' for 1895, is a very valuable work. The illustrations are alone worth the price of the book," writes Mr. J. G. Allshouse, of Long Run, Pa.

The Biddle Photo Stock Company, 16½ East Washington Street, Indianapolis, Ind., is a new concern with bright prospects. They carry a good assortment of goods and sell very favorably to cash buyers.

"**You have** more than fulfilled your promises in regard to it, and I consider it a work of art in every respect, which ought to be in the hands of every photographer both professional and amateur," writes Emil de Neuf in regard to the "Times Annual."

"**I cannot refrain** an expression of my conviction that your monthly is beyond all odds the finest magazine of its kind in the world. The February issue in point of literary and artistic excellence can hardly be surpassed."

Thus writes a well-known amateur photographer of La Crosse, Wis., regarding The Photographic Times.

Ernst Gundlach, formerly at the head of the Gundlach Optical Company, has issued a circular announcing to the photographic public that he has commenced business on his own account in connection with Erastus U. Ely, of Rochester.

We learn from the West that the Ilotype paper is having a "boom" in St. Paul and Minneapolis and adjacent territory; also in California, on the Pacific Coast. In fact the paper seems to be "booming" pretty nearly everywhere just now, West as well as East.

Another valuable book for photographers is "The Platinotype," by Captain Abney, which will shortly be issued by The Scovill & Adams Co. The price of this book is not yet announced, though it will probably be 50 cents in paper covers; $1.00 cloth bound.

The business of W. D. Gatchel, Agent, will be continued under the name of W. D. Gatchel & Sons. Mr. Gatchel's two sons—A. D. (Manager of the Birmingham house) and F. E.—will be engaged in the business with their father, the Birmingham house continuing the same as heretofore.

Read what W. Kurtz says regarding Merck's Pyrogallic Acid.—"We take pleasure in stating that the only negative developer which has given us complete and constant satisfaction, and whose quality and work we can rely upon to be always the same, is Merck's Pyrogallic Acid."

(Signed) Coloritype Company,
W. Kurtz.

The History of the Kinetograph, the Kinetoscope and the Kineto-phonograph, by W. L. K. and Antonia Dickson, with a preface by Thomas A. Edison, the inventor, in fac-simile of his handwriting, and with numerous illustrations from photographs made by the kinetograph, etc., is a new pamphlet of 50 pages which will be read with a great deal of interest by all photographers.

It will be sent postpaid by mail to any address on receipt of the price, 25 cents.

A new book, entitled "The Photogravure," by Henry Blaney, a practical photogravure worker, will shortly be issued by The Scovill & Adams Company as No. 50 of the well-known Scovill & Adams Photographic Series.

It is eminently a practical book, containing definite instructions for learning how to make a finished photogravure, so that one who knows nothing about the process whatever can become an expert worker by following its instructions.

It contains full information regarding the material used, where it can be obtained, and a list of the literature on this subject. The book will be sent postpaid to any address, in paper covers, on receipt of 50 cents; cloth bound (library edition), $1.00.

It will be for sale by all dealers in photographic goods, booksellers, etc., etc.

The Geneva Optical Company, of Chicago, announces that it has sold its optical business to the Treleovan Optical Company, of 83 State Street, Chicago, which they think is a better location than their present place for this kind of business.

The store is on the ground floor, with a large front window. The Treleovan Optical Company proposes to have a first-class store with a complete stock of goods for professionals and amateurs, and have every indication for a successful business.

The Coloritype Company, of New York, writes as follows to Mr. Merck, under date of February 4, in regard to their well-known brand of Pyrogallic Acid:

" In a long, extensive and varied experience with developers of negatives, I have, without exception or variation, obtained the most desirable results and had the least difficulty with Merck's Pyrogallic Acid. There is not another 'pyro,' nor indeed another developer, that makes the process such 'plain sailing,' and its outcome so certain and pleasing."

I must congratulate you upon the appearance of the February number of The Photographic Times. It is in appearance far superior to anything you have done. I am interested to see that you have adopted the Harvard motto which appears on the Harvard seal of "Veritas." There isn't a better motto that you could adopt. I am naturally very proud of it and am always interested when it is adopted. It is certainly the finest journal published.—Morris Earle.

"Annual" of the Photo. Times.—There are some books which it is never well to be without, and of such are the photographic annuals. We have to hand the "Annual" of the Photographic Times for 1895, replete with up-to-date information on all subjects pertaining to photography. We have not only the record of other people's successes, but also the record of their failures and how they overcame them. The illustrations are, as usual, excellent, and although there is nothing in the way of color work—which is to be regretted—still we cannot grumble. The editions of these "Annuals" are soon sold out, the demand being very great, and a hint to the wise, etc.—*Inland Printer*.

"The American Annual of Photography and Photographic Times Almanac" for 1895.

This volume is the ninth issue of its series. The improvements in the annual and the increased sales the publishers report indicate the wonderful extension of interest in photography for the past few years. This issue contains a very large number of articles contributed by competent authorities upon various matters connected with technical and artistic photography, an extensive arrangement of "Standard Formulas and Useful Receipts," a list of photographic books published in English, French and German, from August, 1893, to August, 1894, record of new patents, lists of photographic societies in the United States and in foreign countries. A chief attraction lies in the scores of full-page and lesser illustrations, some of which are extremely beautiful.—*The Review of Reviews*.

As Necessary as "Regular Meals."—J. C. Carpenter, of Cincinnati, replying to an inquiry from the Photographic Times Publishing Association, as to whether he wished his subscription renewed or not for the new year, reports as follows:

"You might just as consistently ask me if I wanted my regular meals the balance of this year. Of course, I want The Times to come right along, and I wish to congratulate you upon its improved form as a monthly. It is certainly away ahead of anything published in its line, at least so far as I have had occasion to observe, and I read about all of them."

There are varying opinions and conflicting dicta as to whether photography is an art or a science, but an inspection of this, the ninth American "Annual," convinces us that it is both. Perhaps one-fourth of the 200 illustrations are devoted to the technical aspects of photography, but the remainder are choice selections from the best work of the year, presented with a view of showing the truly artistic spirit which is now so evident in the work of our foremost photographers. The reading matter embraces descriptions of nearly everything new in the way of apparatus, formulæ, etc., and the selections in this line are such as will make the work valuable to both the professional and amateur photographer. To the person who makes no pretensions to knowledge of the science-art, the "Annual" will serve as a delightful picture gallery.—*The Pharmaceutical Era*.

Annual.—If "a thing of beauty is a joy for ever," this "Annual" should not have its existence limited to the present year of grace. With a magnificently finished photograph of a handsome young lady for a frontispiece, and over 200 fine illustrations, its immortality should be insured. The photographer who purchases it will find 167 of the choicest standard formulæ and useful receipts to help him perfect his art, an abundance of tables of exposure, emulsion calculations, poisons and antidotes, standard diaphragms, scales for focusing lenses, enlargement and reduction, Latin, German, English and French names of all his chemicals, etc. It also contains a large number of short scientific articles relating to photography, a list of all photographic societies here and abroad, with other interesting features too numerous to mention.—*Popular Science News*.

"The American Annual of Photography."—The older this "Annual" becomes the better and more plethoric it grows, from which it follows that the present one excells its predecessors. The volume for 1895 is very richly illustrated, containing, as it does, no fewer than 200 phototypic engravings, while the literary matter, too, is much above par. The contributors reside both in the new world and the old, and embrace such names as Andressen, Burton, Ehrmann, Klauser, Duchochois, Dresser, Mason, Sarony, and Emerson, eighty-seven in all.

Taken all in all, the "Annual" is one of great value. As usual, it is admirably printed on stout calendered paper, a factor in explaining the excellence and brilliance of the numerous engravings interspersed throughout its pages.—*British Journal of Photography*.

Business Notices.

FOR PLATINUM EFFECTS, use the Nepera Platinoïd-Bromide paper. Same price and manipulation as the Nepera Bromide Paper. For sale by
THE SCOVILL & ADAMS CO.

WANTED—Copy of The Photographic Times for July 20, 1894. Editor The Photographic Times, 423 Broome Street, New York.

PORTRAIT ENLARGEMENTS FOR THE TRADE.—Photographers can save money by dealing with us.
N. L. STONE & SON,
56, 58 and 60 Market St., Potsdam, N. Y.

WANTED.—Bound or unbound copie of vol. 12 of The Photographic Times. Please address, giving price, the Editor of this magazine.

BIG OPPORTUNITY FOR ENTERPRISING YOUNG MEN.—Photo. Stock House, carrying stock of about $20,000, in first-class situation in a large city, offered at a very low price. Stock in good condition. For further particulars address B. W. J., Room 86, World Building, New York City.

FOR SALE.—The best located gallery in city of 100,000. Price $500, if sold NOW. Address Leopold, 831 Chapel Street, New Haven, Conn.

FIFTY PER CENT. REDUCTION.—4 x 5 Waterbury Detective Camera, with six holders, cost $30, will sell for $15. W. H. C., care Photo. Times.

FOR SALE CHEAP.—Single swing, Anthony, 8 x 10 view camera, 3 double dry-plate holders, 1 8 x 10 single view Darlot lens, 1 single swing Scoville 5 x 8 view camera, tripod and 6 double plate holders, 9 5 x 8 printing frames, 1 8 x 10 Platyscope portrait lens. Address,
W. A. ROBERTS,
Vaughnsville, Putnam Co., O.

DO YOU WANT a Photo Studio that will pay for itself in three months?
Write to E. B. LUCE,
Millbury, Mass.

A COPY each of NEGATIVE MAKING, INSTRUCTION IN PHOTOGRAPHY, PHOTOGRAPHY WITH EMULSIONS, by Captain Abney, and a copy of THE ART AND PRACTICE OF SILVER PRINTING, by Captain Abney and H. P. Robinson. The London Edition, aggregating $2.00, will sell for $1.00, or will send by mail, postpaid, any one copy for 35 cents. Address,
L. A., care of THE PHOTOGRAPHIC TIMES.

PLACE YOUR ORDERS now for the PLATINOTYPE, by Capt. Abney, and the PHOTOGRAVURE PROCESS, by Henry R. Blaney. Both books in the press to be ready soon. THE SCOVILL & ADAMS CO.

FOR SALE—Gallery, location the best, in Buffalo, N. Y.; will be sold cheaply. Address
DAVID TUCKER, 37 Court St., Buffalo, N. Y.

WANTED, to buy, A No. 1 negatives; must be landscape or marine. Address, enclosing stamps, for full particulars, ARTISTS' ASSOCIATION,
47 N. 13th St., Philadelphia, Pa.

Chas. R. Stevens, Pres't and Treas.
Geo. P. Mackin. Vice-Pres't and Sec'y.

CHICAGO PHOTO STOCK CO.,
Dealers in
Standard Photographic Apparatus and Supplies,
38 E. Randolph St., Chicago, Ill.

FOR SALE—Photo studio in the city of Boston; chance of a lifetime for an enterprising man; low rent; location unsurpassed; run by present owner a number of years; will bear full investigation; ill health reason for selling. Address "PHOTOGRAPHER,"
Lock Box 1598, Boston, Mass.

AN A No. 1 OPERATOR to buy a half interest in one of the finest studios in New England, where a little money will open a way to a fine business; will sell complete; write and receive very satisfactory reason for sale.
BOX 823, Hartford, Conn.

BECK LENS CHEAP—An 8 x 10 Beck Rapid Rectilinear lens and slow time and instantaneous shutter in good condition; cost $60; sell for $45. Also a 6-inch Morrison Detective Camera lens for instantaneous work for $15.

WILL EXCHANGE 5 x 7 Eastman camera, folding tripod, 5 x 8 Gundlach lens, and six bookholders; cost $77; nearly new and in perfect condition, for a No. 4 Folding Kodak, or "The 400" 4 x 5 camera. Address
HERTWIG, 813 Greene Ave., Brooklyn, N. Y.

WE WILL PAINT YOUR PHOTOGRAPH in water colors, cabinet size, and mount same in handsome mat for 75 cents; in white and gold frame, $2.10; any 5 x 7 photo painted in water colors true to nature for $1.
ARTISTS' ASSOCIATION,
47 N. 13th St., Philadelphia, Pa.

WILLIS & CLEMENTS have a new Platinotype Paper. See page 13 of the advertising pages.

FOR SALE CHEAP, or exchange, two outfits, one has shutter and extra plate-holders. Address W. P. Little, Lamont, Buchanan, Iowa.

FOR SALE CHEAP—A 5x7 Excelsior Camera, with tripod complete. Address, J. E. C., P.-O. box 781, New York City.

"AMATEUR PHOTOGRAPHY," by W. I. Lincoln Adams, is "A Practical Guide for the Beginner." Illustrated. Paper covers, 50 cents; cloth bound, $1. The Second Edition is now ready.

NOTICE.—The business of The Cummins Stock Co. will not be affected by the death of Mr. J. S. Cummins. The business will be continued under the same style of firm as before. Thanking you for past favors,
We are, respectfully,
The Cummins Photo Stock Co.

GALLERY FOR SALE.—In N. Y. State town of about 1,500, best location. Large college and schools. Address A. B. C., care Photograph Times.

GRIT VARNISH.—The best retouching medium in the market; 6-ounce bottle, 40 cts.
THE SCOVILL & ADAMS CO.

ANDRESEN'S PURE SULPHITE, for Amidol, Para amido-phenol, Rodinal, Eikonogen, or Pyro. Use only Andresen's *Pure* Sulphite of Soda.

S. P. C. EIKOQUINOL DEVELOPER.—This "ne plus ultra" developer for timed and instantaneous exposures, lantern slides and all other kinds of transparencies, photo-mechanical work and bromide paper prints is now in stock and for sale at 35 cents per bottle of 8 ounces. No other developer is now used by the members of Chautauqua School of Photography; no other has attained to equally fine results.
THE SCOVILL & ADAMS CO.,
423 Broome Street, New York.

NO MORE

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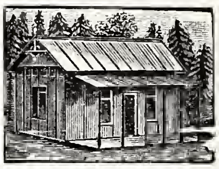

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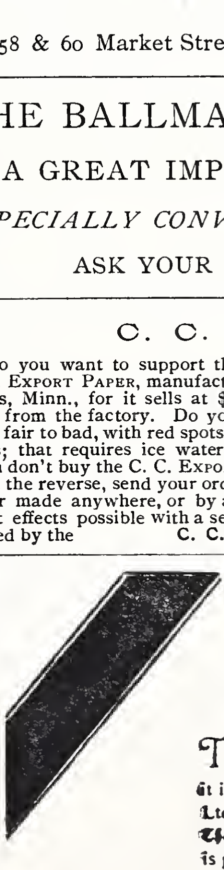

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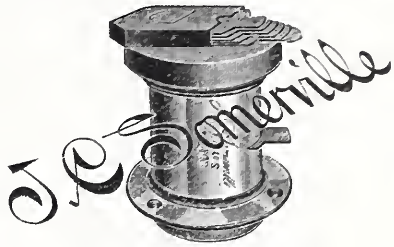

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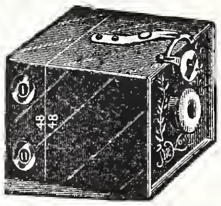

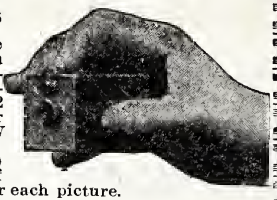

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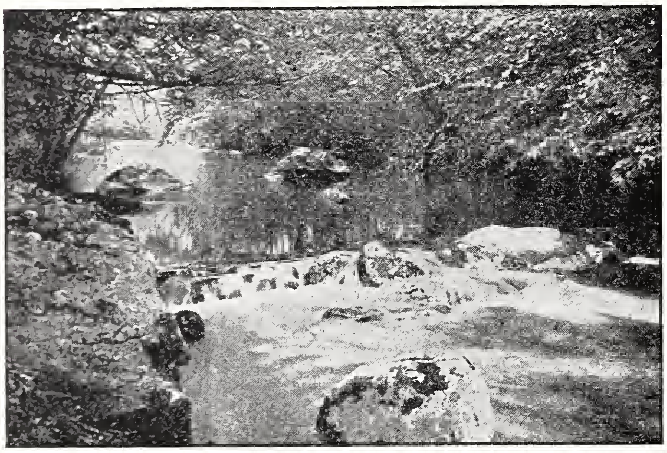

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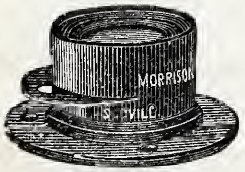

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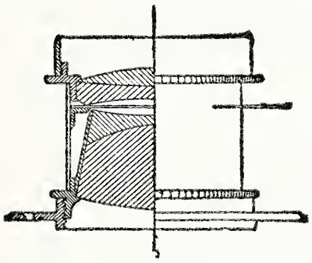
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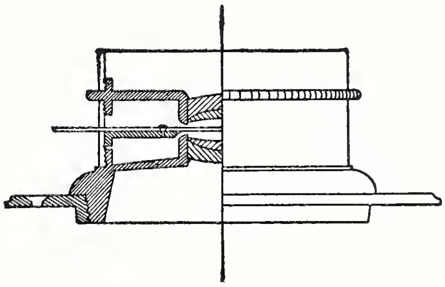
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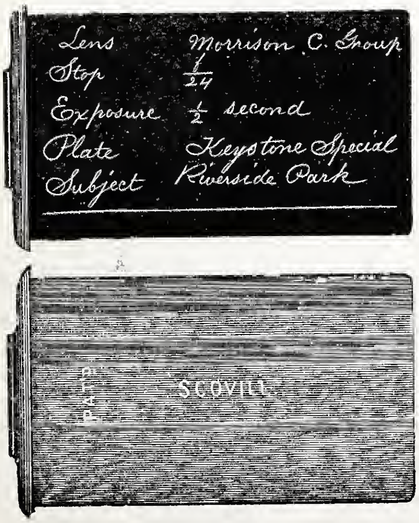
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3¼ x 4¼	$0 15	$1 50	5 x 7	$0 33	$3 50	8 x 10	$0 70	$8 00	3⅞ x 5½ Cabt. Trim.	$1 70
4 x 5	20	2 00	5 x 8	35	4 00	20 x 24	4 00	48 00	Cabinet 2ds	1 00
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Maxima Combined Toning and Fixing Solution, 8-ounce bottles, 30 cents.

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Sample of Paper
Free upon Application.

United States Aristotype Co.
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Scovill's

Henry Clay 2d.

A 4 x 5 folding camera (second to none but the $55 Henry Clay). Price only $15. Pneumatic safety shutter, excellent lens, reversible view finder and three (3) double plate-holders.

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The Scovill & Adams Co.,
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For General Portrait Photography, Commercial and View Work.

"Perfection" (Collodion) Paper.

Cabinets, $1.50 per gross.

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Other sizes in proportion.

JUST WHAT YOU WANT!!

If your dealer cannot supply these goods, send direct to us, and order will be filled through some reliable party.

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MAKERS OF
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246 WOODWARD AVE.,
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Gentlemen: A Lens that we can use for Portraits must combine speed, softness, definition and roundness; these points are first, price next. Your **SUTER LENS** sold us has all of these requirements, and we take pleasure in advising its use whenever others want the same.

Yours truly, C. M. HAYES & CO.

Send for price list and testimonials to the Sole Agents for the United States,

ALLEN BROS., Photo Materials,
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Scovill's
New Waterbury
Camera,

Containing (new) safety shutter, view finder, (new) focusing adjustment, three (3) double plate - holders. Leather covered. All for $15.

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No!

Better do so at ONCE.

The Scovill & Adams Co.
Have Them.

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Lenses are the Best.

TRY THEM BEFORE
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MANUFACTURERS OF

HIGH-GRADE PHOTOGRAPHIC LENSES,

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We invite comparison with any other make, at whatever price. Lenses sent for trial.

RAPID RECTILINEAR LENSES,

complete with shutter having "silent time" and adjustments for al degrees of speed, with pneumatic release, the workmanship of which we guarantee of the very best.

4 x 5, 6	inches focus	$13 00
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8 x 10, 12.5	" "	40.00
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ANASTIGMATIC WIDE ANGLE LENSES.

5 x 8, 5.5	inches focus	$15 00
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Double Exposure Attachment for Wide Angle, 4 x 5 and 5 x 7 R. R. Lenses, $2.50. Larger sizes at a small additional cost.

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SOMETHING NEW UNDER THE SUN—A REVOLUTION IN THE ART OF MANUFACTURING.

After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

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THE SCOVILL & ADAMS COMPANY,
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Sample Sheets, by mail, 10 cents each.

JUST PERFECTED.

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THAT IS WONDERFULLY ARTISTIC FOR BOTH LANDSCAPES AND PORTRAITS.

Endorsed by SARONY, of New York,
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Sample 6½ x 8½ print, Portrait or Landscape, on a New Platinotype Card, mailed on receipt of 25 cents; and for an additional 25 cents, we will send, postpaid, a sample package of the New Rough Paper, or our regular smooth paper, with developer.

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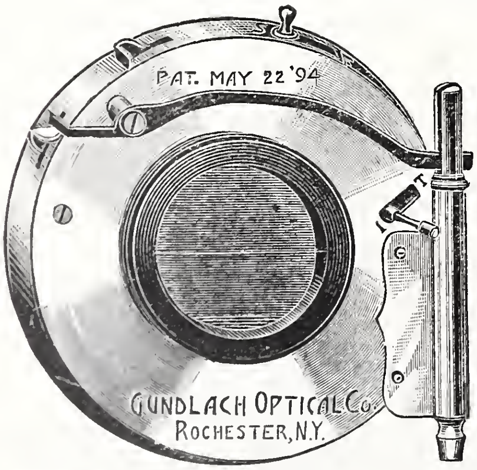

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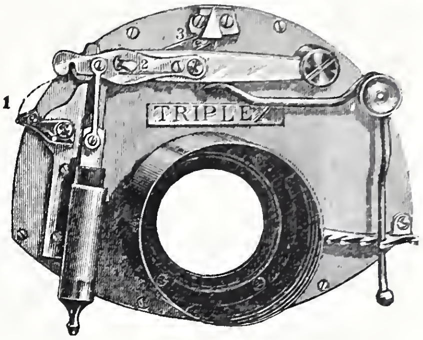
OUR NEW PHOTOGRAPHIC SHUTTER Is the **Best** and **Cheapest** Shutter in the market. It sells at about half the price of other first-class shutters. **Send for Catalogue.**

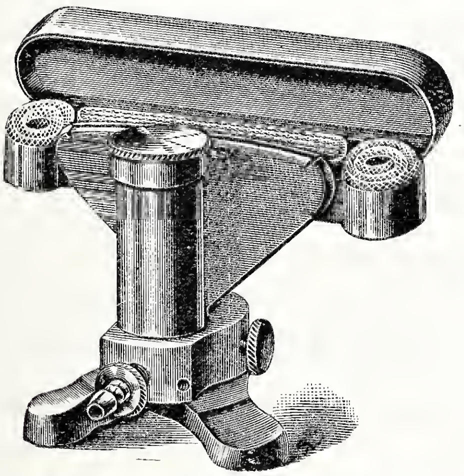
THE TRIPLEX TIME SLOW-INSTANTANEOUS INSTANTANEOUS SHUTTER

Is the BEST Shutter to use at ALL times, but especially at the season when the light is weak, as it gives nearly twice as much illumination under the same circumstances as most other shutters.

Exposures TIME, SLOW-INSTANTANEOUS, and RAPID-INSTANTANEOUS.

Average maximum speed of ALL sizes about $\frac{1}{150}$ second ; smaller sizes much greater.





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IT GIVES SATISFACTION.

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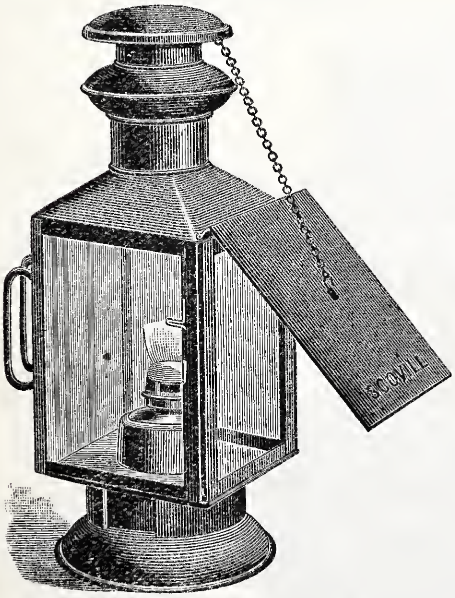

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Such is the reports of experts who have had them in use for months.

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BECAUSE it is constructed so that white light does not escape.

BECAUSE it gives ample light for the dark-room.

BECAUSE the abundant light does not fog, but does show any spot or blemish in the plate.

BECAUSE so much of the light may be thrown into the developing dish and be shaded from the eyes.

BECAUSE it may be used either with coal oil or candle.

BECAUSE the flame may be so quickly controlled by unlatching the door or uncatching the bottom of the Lantern.

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"NON-COCKLE,"

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40 Cents per Bottle.

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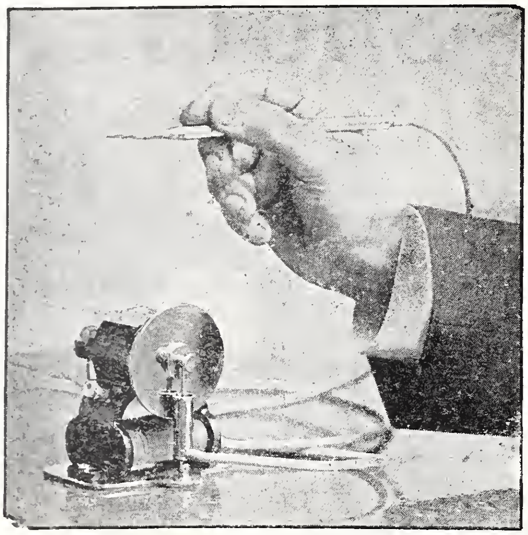

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AS A DEVICE FOR ASSISTING THE RETOUCHER, HAS NO EQUAL.

IT IS A NECESSITY IN EVERY GALLERY IN THE LAND.

It will treble your out-put.
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Price, without a Battery	$20.00
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WOODBURY ANTIPYR.
S. P. C. ACID FIXING AND HARDENING COMPOUND.

TRY THEM. FOR SALE BY ALL DEALERS.

The result justifies the expense.

$55

buys a Henry Clay Camera, and you get a $55 result in every picture.

Our Henry Clay Manual tells all about it. Free.

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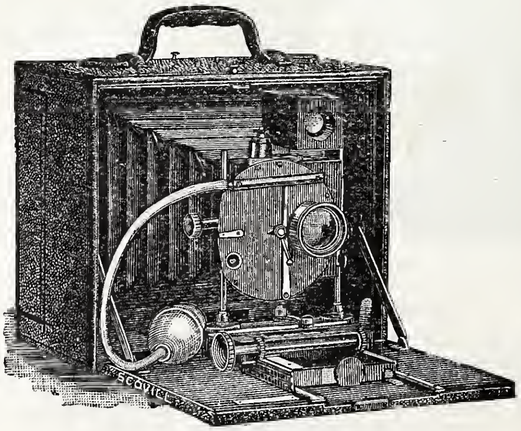

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BRANDS:

RECORD	HARVARD	CRESCENT
Extreme Rapidity.	Rapid.	Slow.

Orthochromatic, Non-Halation, Lantern and Tropical Plates.

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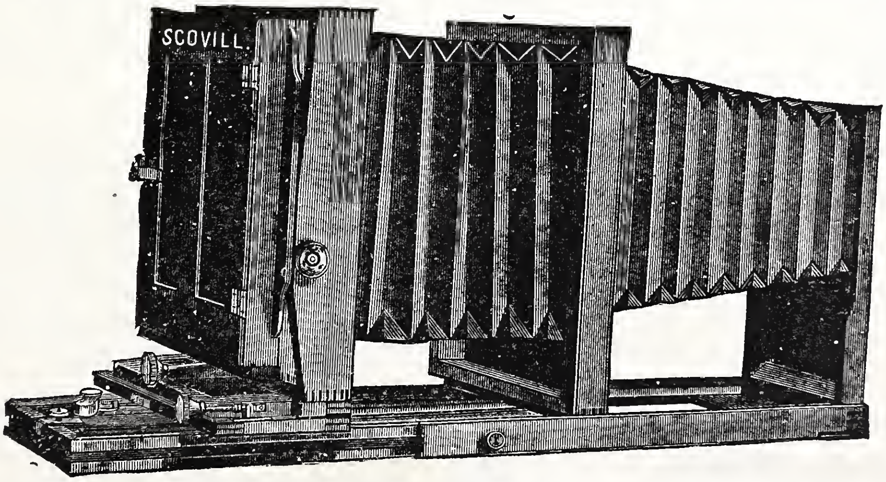
UNRIVALED PORTRAIT CAMERAS.



The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.				With Double Swing-back.
5	8x10 ins.,	with platform	30 in. long		$38 00
6	10x12 "	" "	36 "		48 00
7	11x14 "	extension "	48 "	and vertical snifting front	64 00
8	12x15 "	" "	48 "	do	72 00
9	14x17 "	" "	60 "	do	76 00
10	16x20 "	" "	65 "	do	88 00
11	17x20 ins.,	extension platform	65 in. long	and vertical shifting front	90 00
12	18x22 "	" "	70 "	do	100 00
13	20x24 "	" "	72 "	do	110 00
14	22x27	" "	72 "	do	130 00
15	25x30 "	" "	80 "	do	170 00

EVERYTHING FOR THE CAMERA.

Have You Tried the : : :

NEW ROSS-GOERZ LENS?

American Agent for Ross Lenses.

ROSS Portrait and View Lenses.
ROSS-ZEISS Anastigmatic Lenses.
ROSS-GOERZ Double Anastigmats.

All Brands of : : :
DRY PLATES, PURE CHEMICALS AND SUPPLIES of all kinds.

ALL THE LATEST HAND AND TRIPOD CAMERAS.

Descriptive Catalogues of any of the above sent on receipt of five cent stamp for postage.

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ABSOLUTELY PURE.

We have at last obtained a Photo Blotting Paper (The Albion) which is absolutely chemically pure. It is a very different article from ordinary blotting paper, which always contains more or less impurities that are injurious to photographic prints. This paper may be used in the most delicate photographic operations with perfect safety. We had it especially made for photographers' purposes, and can unhesitatingly recommend it.

Price per Half Ream, -	**$12 00**
" " Dozen Sheets, -	**72**

ASK YOUR DEALER FOR

Albion (100 lb.) Photo Blotting Paper.

THE SCOVILL & ADAMS CO.,
SOLE IMPORTERS.

Felt Backgrounds.

The Scovill & Adams' Plain Felt Background, recently introduced, is a great boon to all Photographers, both Professional and Amateur.

It is made of strong, thick and even stock, and is of an agreeable neutral drab color. It is especially suitable for vignetting. The texture of the cloth absorbs instead of reflecting light, and thus produces soft effects, and agreeable depth in print. The liability of defacement by water stains is obviated.

The prices of these grounds are as follows:

4 x 6 feet	$2.50
5 x 6 "	2.75
6 x 6 "	3.00
6 x 7 "	3.50
6 x 8 "	4.00

These sizes may be sent by mail on receipt of 35c. extra.

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OR BY
The Scovill & Adams Co.
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CARBUTT'S DRY PLATE AND FILM WORKS.

Original American Dry Plate Factory.
ESTABLISHED 1878.

JOHN CARBUTT PROPRIETOR
TRADE MA K

Office and Factory : Wayne Junction, Philadelphia.

We reduce our prices to suit the times; see following price list:

AND HAVE NO CONNECTION WITH ANY DRY PLATE RING OR TRUST.

ECLIPSE and ORTHO. 27.

Process and "A."

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¾ x 4¼	$0 40	......	36
4 x 5	60	$0 80	36
4¼ x 5½	70	90	24
4¼ x 6½	80	1 05	24
4¾ x 6½	90	1 10	24
5 x 7	1 00	1 25	24
5 x 8	1 13	1 45	24
6½ x 8½	1 50	1 95	12
7 x 10	2 00	2 45	12
8 x 10	2 15	2 80	12
10 x 12	3 40	4 40	4

Reduced 10 per cent. from old list.

"B" 16 and 20.

Special and Ortho. 23 and 25.

Sizes.	Per Dozen.	Strippers, Per Doz.	No. Doz. in Case.
3¼ x 4¼	$0 38	....	36
4 x 5	55	....	36
4¼ x 5½	65	....	24
4¼ x 6½	75	... .	24
4¾ x 6½	85	....	24
5 x 7	94	$1 25	24
5 x 8	1 05	1 45	24
6½ x 8½	1 40	1 95	12
7 x 10	1 80	2 45	12
8 x 10	2 04	2 80	12
10 x 12	3 25	4 40	4

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COLUMBIAN ANTI=HALATION PLATES.

Sens. 23 to 27. Eclipse and Ortho.

Sizes.	Plain.	Strippers.
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4 x 5	70	....
4¼ x 5½	80	....
4¼ x 6½	95	....
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5 x 7	1 15	$1 40
5 x 8	1 30	1 55
6½ x 8½	1 75	2 10
7 x 10	2 20	2 65
8 x 10	2 55	3 06
10 x 12	3 95	4 75

Larger sizes up to 24 x 36 at proportionate reduced prices.

CARBUTT'S LANTERN PLATES lead all other makes, 55 cents per dozen, 36 dozen in a case.

Specialties:
Carbutt's Patent Dry Plate Lantern,
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J. C. TABLOIDS, for Home use and Tourists.
Color Screens for the PHOTO-CHROMIC PROCESS.

FOR SALE BY ALL MERCHANTS IN PHOTOGRAPHIC MATERIALS. SEND TO FACTORY FOR CATALOGUE.

Look out
for
imitations
of

WATERBURY CARDBOARD.

Look out
for the
genuine, too,
and see
that you
get it.

It is
the Best
and Cheapest.

CARBUTT'S "G. A" LANTERN PLATES.

THE UNIVERSAL PLATE.

Made on Specially Imported THIN CRYSTAL GLASS, Size 3¼ x 4, 55 Cents per dozen.

Are the perfection of Plates for producing Slides by contact, or reductions in the Camera. Their qualities are too well known to need further recommendation.

Owing to our new method of packing these plates, they are more perfectly protected and less liable to abrasion.

For Developer, we recommend either our **EIKO-cum-HYDRO Two-Solution Developer**, or our **J. C. TABLOIDS.** A powerful Developing Agent, allows one-half exposure. Price, 75 cents per box, post free, containing 96 Tabloids, enough to develop 8 to 12 dozen 4 x 5 Plates or Films, and twice or more that number of Lantern Plates.

CARBUTT'S GROUND GLASS TRANSPARENCY PLATES

For Making Beautiful Window Transparencies.

The above Transparency Plates were the ONLY onces receiving the World's Fair Award.

☞ SEND TO FACTORY FOR CATALOGUE OF PLATES AND SPECIALTIES.

FOR SALE BY ALL DEALERS.

NOW IS THE TIME FOR FLASH=LIGHT WORK.

AND YOU WANT A GOOD MACHINE.

The Hunter Flash=Light Machine

IS THE BEST.

We have in this machine an apparatus specially arranged for the distribution of the light all over a large surface, and the system employed in igniting the powder is such that the greatest illuminating power possible is obtained from a given quantity of powder. As a matter of fact, this is over twenty times greater than the luminosity that would be obtained by burning the powder in a mass.

The advantages of this machine are that it can be taken apart or put together in less than three minutes. The tripod, although the lightest made, is the most rigid when set up, and can be raised higher and dropped lower than any other machine.

The principle employed is simple and practicable, consequently it is not liable to get out of order or fail when using.

The powder is thrown into the flame by the stroke of the hammer under the pan which separates and spreads the powder over a large surface, and so giving a far more brilliant light than would be obtained by the usual method of throwing the powder in the flame; as the powder being separated burns much quicker and the combustion is more perfect, not a grain of powder can escape ignition.

Where gas cannot be conveniently used the inventors recommend an alcohol machine devised by them. It is a very simple arrangement, and certainly to be preferred to the dangerous gasolin

Send for circular giving complete description and directions.

PRICE, - - - - - - Only $45

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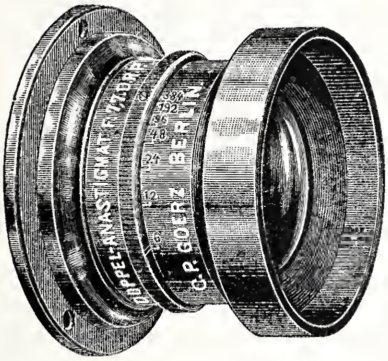
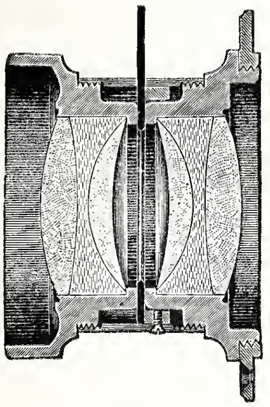


German Patent No. 74,437.
American Patent No. 528,155.



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Double Anastigmats

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THE MOST PERFECT OF MODERN LENSES.

Possessing wonderful marginal definition and depth of focus. . . . .

Series III. F:7.7 (angle 70-90°), universal extra-rapid lens, for portraits, groups, instantaneous photographs, landscapes, architecture, interiors and enlargements.

Series IV. F:11 (angle 75-over 90°), rapid copying lens, for full-size reproductions, enlargements, large groups, landscapes, instantaneous photographs, interiors.

Price List and information given, free of charge, on application.

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British Journal, 1893, No. 1728.
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Satisfies those who want the BEST.

For they are the standard of . . . .

Excellency, Rapidity and Uniformity.

To-day are even better than ever.

INCOMPARABLE for the Studio.
for Landscape Photography.
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A PLATE

that has maintained the lead for years, by being the most reliable, the most Rapid, having the best printing qualities, and being easy to work, will prove to be

ECONOMICAL.

If you are looking to your own interest, you will

USE
CRAMER'S PLATES.

Our Celebrated Walpole Hypo.
(Regular "Old Style" Large Crystals.)

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PUREST HYPO MADE.

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Products Unsurpassed.

Produce Fine Negatives.

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☞ We do not solicit retail trade. Where consumers cannot obtain our products from their usual sources of supply, we will furnish them on application; but it must be understood that in these cases we charge the full retail prices, and that cash must accompany the order.

Send 5 cents (stamps) for each sample or 25 cents (stamps) for 6 samples.

Walpole Chemical Co.,
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HAVE U TRIED

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IF not, WHY not?

They are the only plates on the market giving the full ISOCHROMATIC EFFECT without the use of a color screen.

Write for Descriptive Catalogue to

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THREE SHIELDS

LIGHTNING PLATE.

SWIFT AS LIGHT.

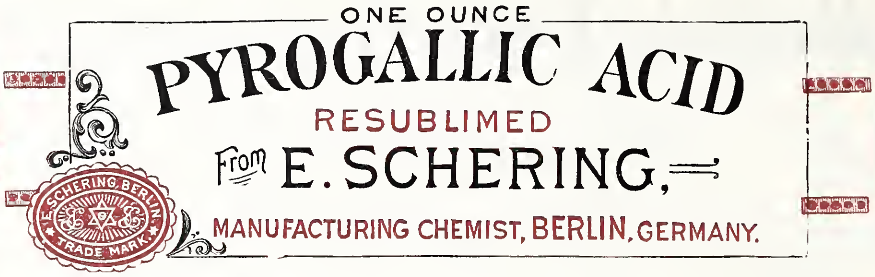
For Studio, Snap Shot, and other Extremely Rapid Work.

WARRANTED PERFECT, CLEAN, CLEAR AND BRILLIANT.

FOR SALE BY ALL DEALERS.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.



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PYROGALLIC ACID
RESUBLIMED
From E. SCHERING,
MANUFACTURING CHEMIST, BERLIN, GERMANY.

REGISTERED.

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THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none.

Send Orders to your Dealers, or to

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Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND. It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

THE CLIMAX PLATE.

THE LATEST PRODUCTION OF

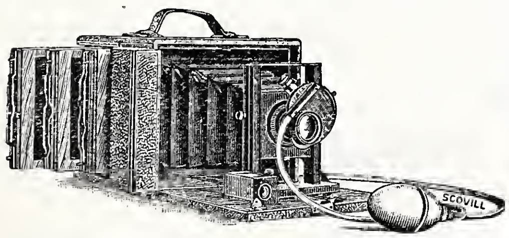
THE STANDARD DRY PLATE CO.

THEY ARE WORTHY YOUR TRIAL, FOR THEY ARE QUICK, CLEAN AND BRILLIANT, AND POSSESS THE VERY FINEST PRINTING QUALITIES.

THE PRICE, TOO, IS RIGHT.

ALL DEALERS SELL THEM.

The Henry Clay, Jr.



Partly owing to the march of progress, and partly to the present tight state of the money market, there has long been a demand for a hand camera which should possess all the necessary requirements for good work, but at the same time be obtainable at a reasonably moderate price. That we have successfully met this with our new Henry Clay Junior camera we think all will readily admit on seeing that apparatus. The superb workmanship of the Henry Clay camera is too well known to require any description from us, and we have only to say that, notwithstanding the considerable reduction in the price of the new camera, the finish is in almost every way equal. The Henry Clay Junior is now made in the two sizes, 4 x 5 and 5 x 7, and differs from the ordinary camera of these dimensions in certain points which we shall specify. It contains space for three holders, or six plates. A novel arrangement has been added by which the holders can be slipped into place without the usual inconvenience attached to such proceeding. The lens is a perfect little beauty, and does very fine work. The front portion has a sliding up and down movement for the lens, but no swing; indeed, with a hand camera this is but very rarely necessary, such objects that require it are best left alone with small cameras. The camera front can be fitted into position with the greatest ease. The movement is the work of a second; by pressing the catch the front of the box falls down, a piece of brass is caught hold of, the camera comes forward to the scale and, with one-quarter turn, it is fixed as firmly as a rock into position. The instrument is fitted with revolving diaphragms, reversible finder and an admirable little shutter, which can be used for time or instantaneous work. When closed the dimensions of the 4 x 5 camera are 5¾ x 7 x 6, including space for three holders. Altogether we can thoroughly recommend this instrument to all who require a first-class camera at a moderate price.

It is manufactured in the works of the famous

AMERICAN OPTICAL COMPANY.

Price, 4 x 5 size, $30.00, Price, 5 x 7 size, $38.00.

Including One Double Plate Holder.

Extra Holders for 4 x 5 size, $1.25 each. Extra Holders for 5 x 7 size, $1.30 each.

FOR SALE BY ALL DEALERS AND

THE SCOVILL & ADAMS COMPANY.

Some of our **Specialties:**

The American Optical Company's Apparatus

FINEST IN THE WORLD.

Swift, Steinheil and Zeiss (Imported) Lenses

ACKNOWLEDGED TO BE THE BEST.

Gundlach, Bausch & Lomb, and "Waterbury" (Domestic) Lenses

WITHOUT RIVALS IN POPULARITY.

Morrison Celebrated Wide-Angle Lenses

THE BEST IN THE WORLD.

"Three Crown" Albumen Paper

ABSOLUTELY WITHOUT FAULTS OR BLEMISHES.

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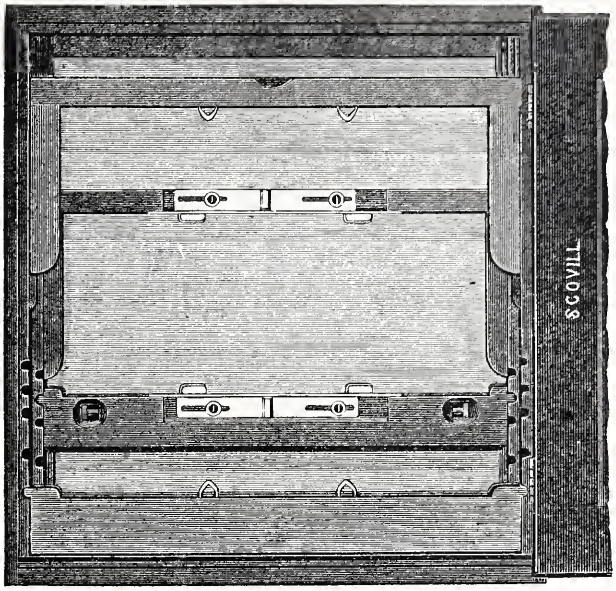

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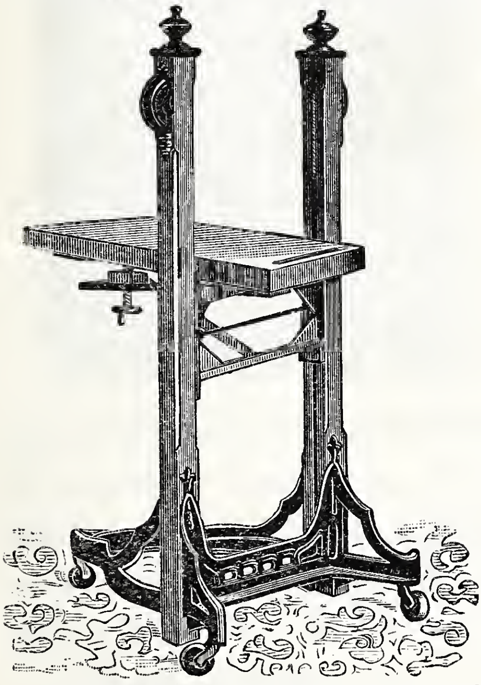

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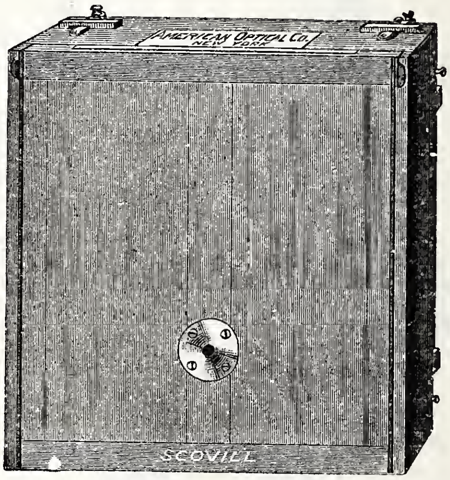
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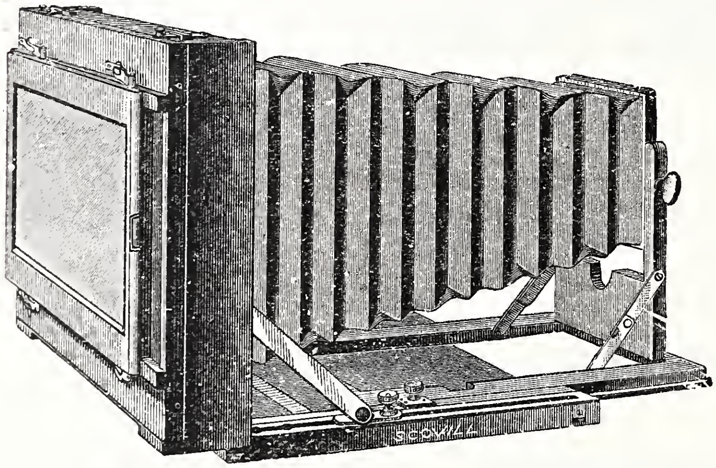

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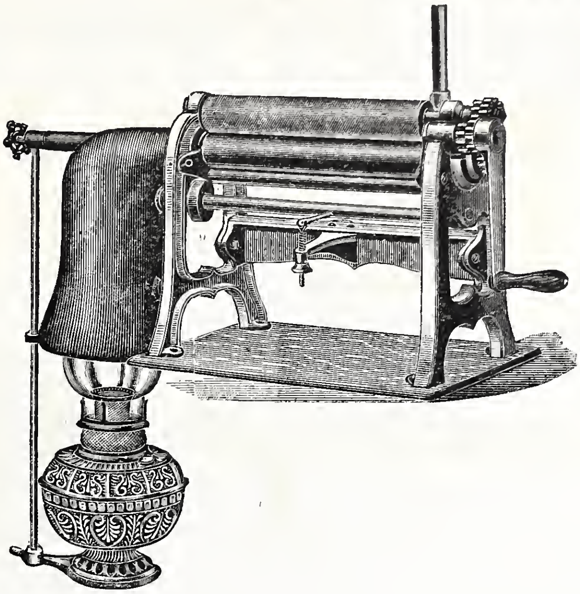

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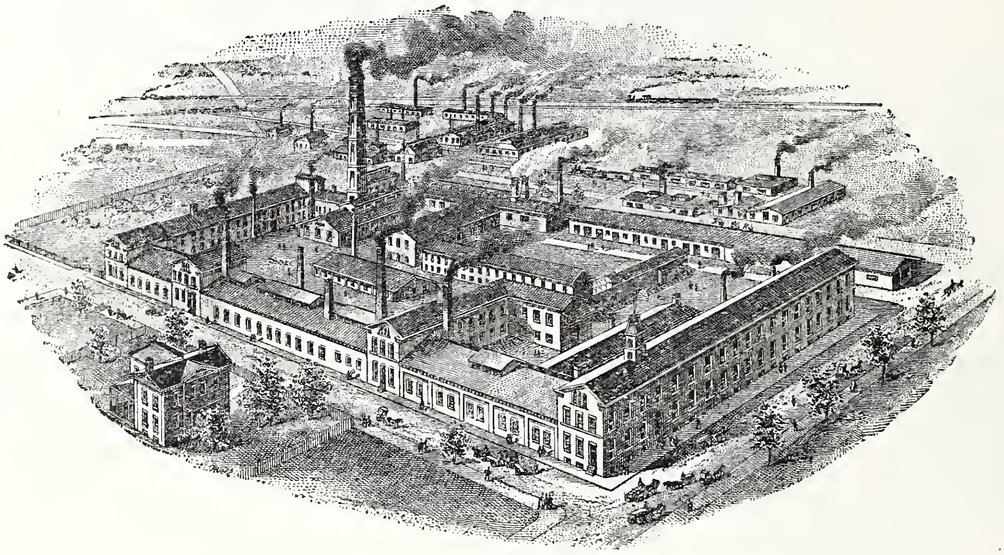

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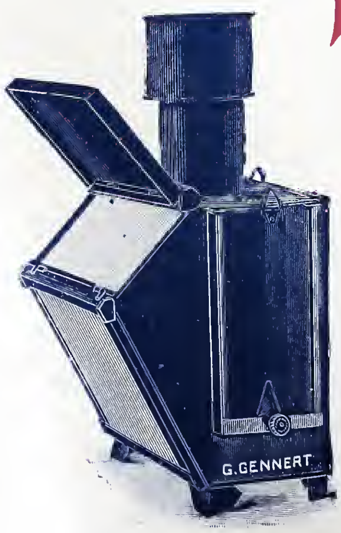

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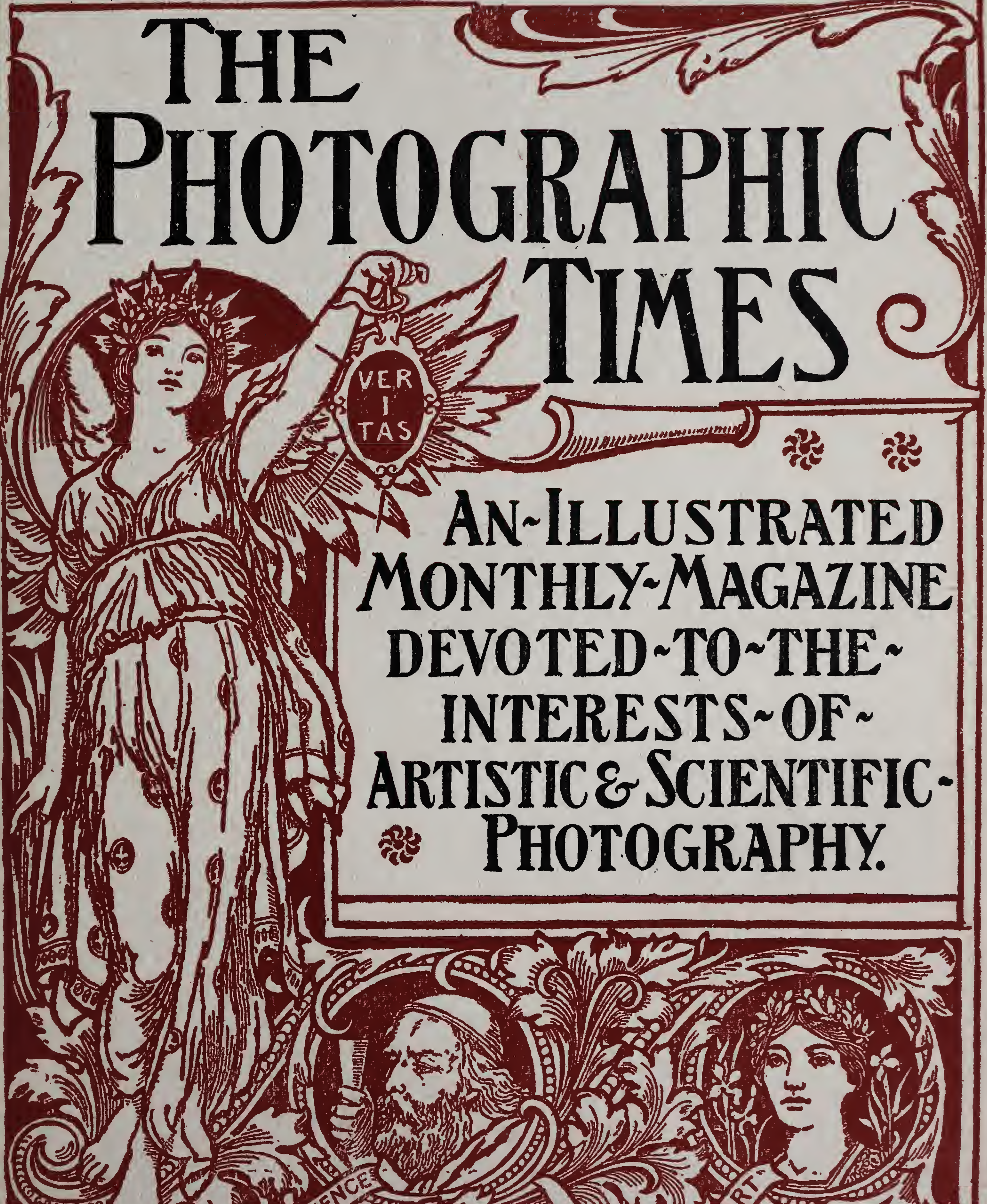

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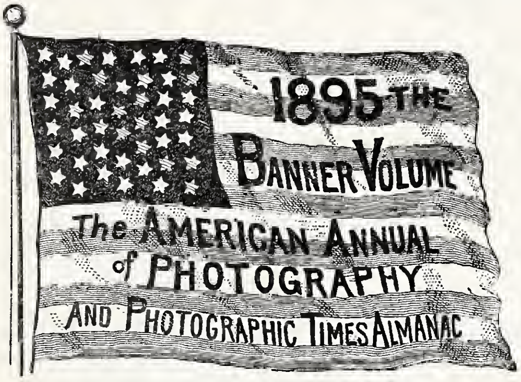

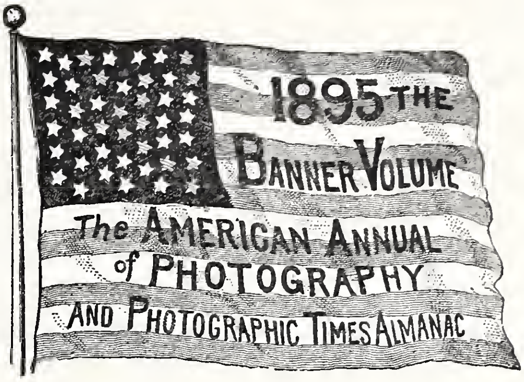

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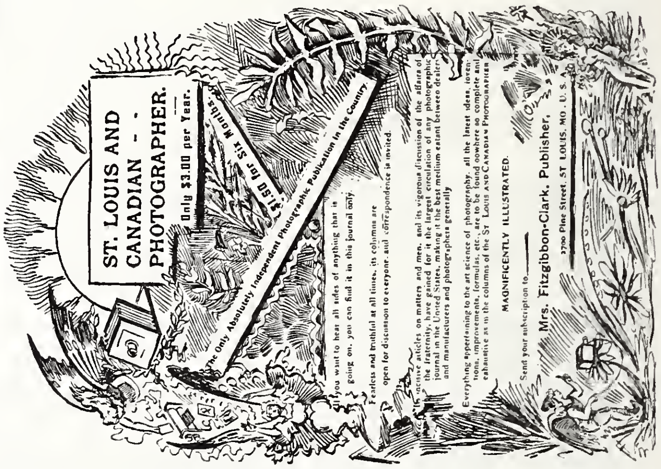

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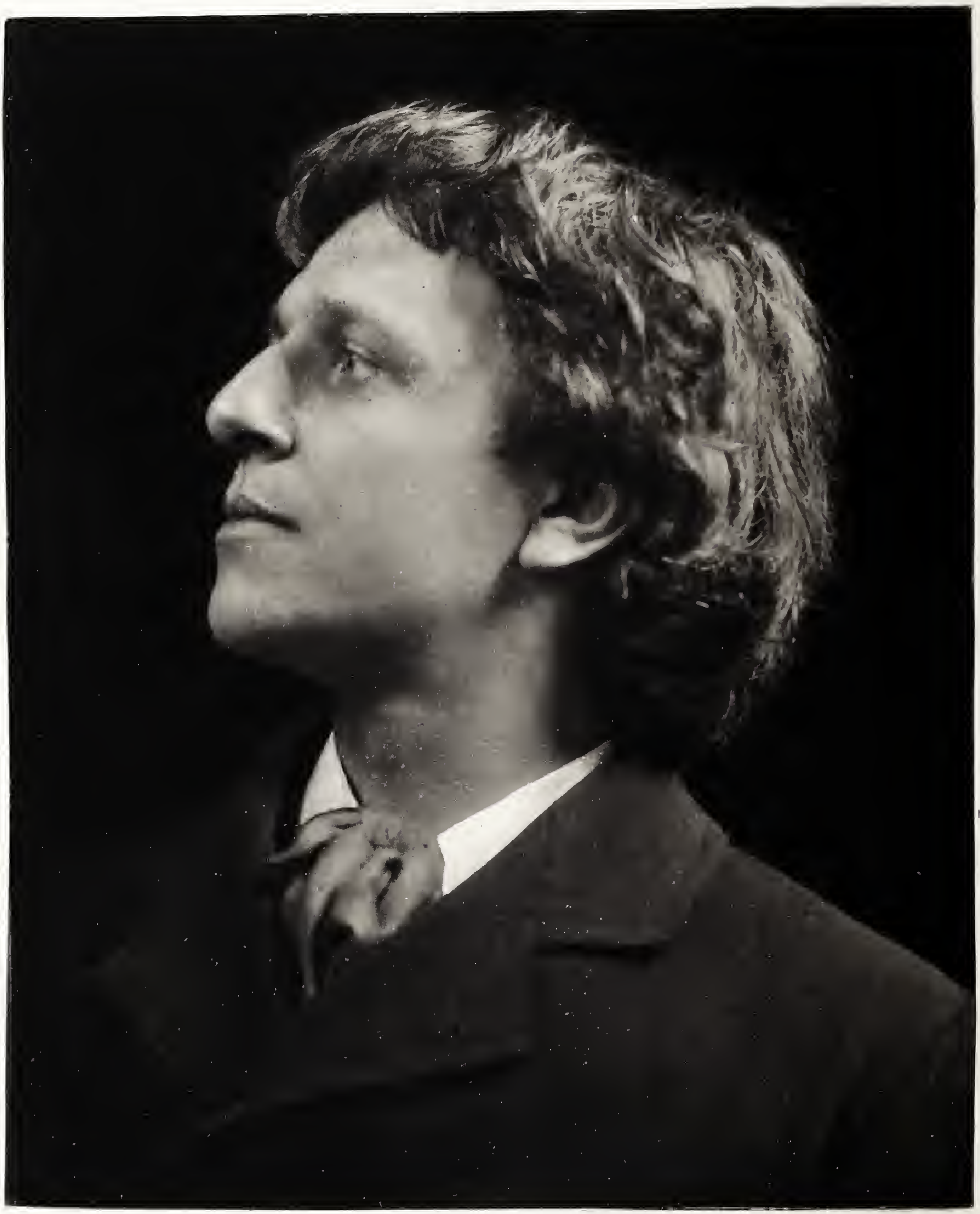

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The reason why the children of the poor are often so much more interesting to us than those of the rich is owing to the presence of homemade garments and a general unkemptness, which frequently runs into that abandon about which there is always a fascination.

The child of the rich or middle class of the community must approach very nearly to handsome to be interesting. It must possess largely some of the important essentials of beauty. Well-formed features, large, expressive eyes, ample hair, or something markedly interesting in the expression, as we occasionally see in children, and under these conditions we may hope for a more or less attractive picture, even when all the adverse conditions prevail of light, stiff, or otherwise more or less absurd costume.

With the average run of children of well-off people, who have no especial pretentions to good looks, and suffer the additional disadvantage of cropped hair and stiffly cut and starched clothes, it is impossible to produce pictures which possess any interest except to the parents and intimate relations of the young hopefuls.

On the other hand, the children of the poor, as we said before, furnish us with the material for those unsophisticated child pictures, which attract from the universal interest attached to child life. Here we must look for the chubby features, flowing, unkempt hair, and ill-shapen garments, of various hues, often torn and sometimes patched, and freed from stiffening, and which assume at once, no matter what the position, the wrinkles of the attitude well impressed, and which mark so strongly the activity, impulse, and energy of the average child.

We see many good photographs of children, and numerous reproductions from photographs, but, alas, they are nearly all too much impressed with the sophistication of artificial life. Stiff, fashionable white dresses, with black stockings, unbecoming for children, disfigure the grace and beauty of the girls, and the boys, well,

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if they are out of petticoats, what are we to do with them? The only redeeming feature is the somewhat recently introduced sailor blouse, which gives us a certain fullness and picturesqueness of drapery, which, coupled with the interest aroused in the association with the sailor, does a deal for the picture. But after the age is passed of the long, flowing hair, and the barber or the thrifty mother ply the scissors the case becomes hopeless. It too often happens, also, that when a child, really picturesque, and in appropriate dress, has been secured, they are posed with such utter disregard to the fitness of the surroundings of themselves and their occupation, if portrayed at childish pursuits, that the effect, if not ludicrous, is at least grating to the observer of good taste. Especially is this apt to be so in the case of professional photographers, who, seeing one or two picturesque children, that strike them as good subjects for a picture, call them into the skylight, and pose them in or about antique chairs, and surrounded or backed up by Grecian or gothic pillars and balustrades, or with any grand accompaniments that happen to be up at the time, all such incongruities playing havoc with the unity and sentiment of the subject.

In the particulars of backgrounds and surroundings the work done by amateurs is often better than that of professionals, because the absence of, or rather want of possession of, painted backgrounds and artificial accessories, compels the use of those natural surroundings which, sometimes at least, fall naturally enough in with the nature of the subject, and, could there always be secured a proper amount of repose in some portion, would furnish us with many good pictures.

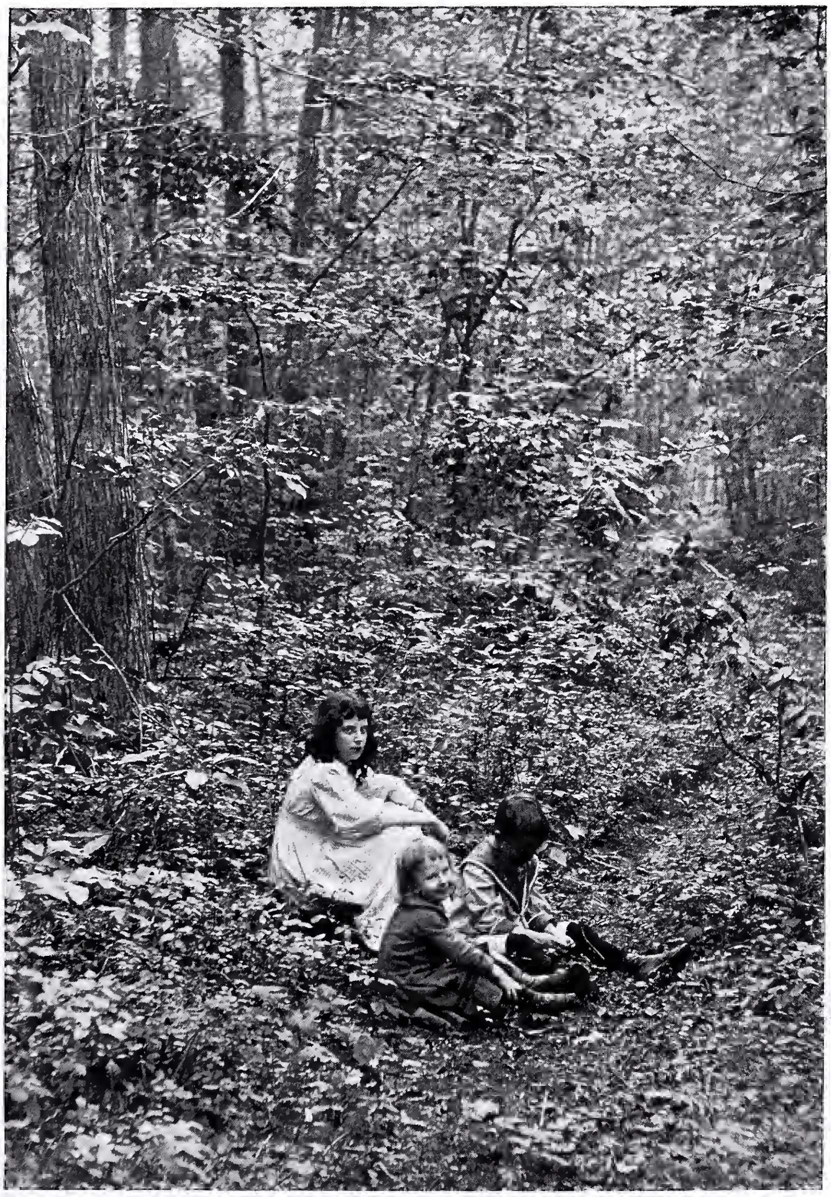
In the case of indoor poses of children, the presence of conspicuous objects back of them, especially near about the head, and often of angular forms, is ruinous of the repose of the background, and especially must attention be drawn to the manner of posing the child. Too little regard is paid to the injurious effect of placing children in high-back chairs and sofas. When these useful pieces of furniture are of a quiet design and quiet in color, the effect may not be so harmful, but in nine cases out of ten they are multiple and conspicuous in design and of a shade of color that comes out either extremely dark or glaringly light, thus asserting themselves so vigorously as to overwhelm the quiet shadings of the child's head. Rattan chairs, and many of the chairs used outside on the porches of country residences are fruitful traps for amateurs in their efforts with children. It is generally safer to eschew chairs altogether in posing children for their photographs. Stools, high or low, are better. The bringing to bear of some thought in the matter will give rise to many ways of adapting circumstances to the occasion, always bearing in mind that the space immediately about the head or heads should be very quiet.

When it is desired to make interesting pictures in which children form the principal aim, independent of mere portraiture, it is particularly desirable that they should be absorbed in some apparently childish pursuit, and those occupations which form many of the important daily routine duties of the grown, and which are apt to be mimicked by children, also come in very nicely. Little girls going through motherly and household duties, and boys whittling and constructing, or occupied in things connected with the arts of war and peace, make good indoor subjects, and especially suited for those working in cities. But in getting up such subjects it should be the aim, as far as possible, to avoid stiff arrangements. A too noted appearance of studied arrangement spoils many a photograph of picturesque intention, by giving an artificial or purposely gotten-up look which we do not see in the real picturesque of actual nature or accident.

For those living in the country, or spending their summers in the country, there is a large field for work in portraying picturesque children. The natural surroundings and accompaniments of the country are so much more interesting and appropriate for children than the artificial surroundings in which they are placed in cities. But the conditions for such work in the country must be favorable. It is not to be supposed that a mere trip into the country is going to furnish us with a number of happy combinations of picturesque children with picturesque surroundings. Should any one fall upon such, it would be by a mere happy chance. Children generally in the country are anything but picturesque when seen abroad, and we all know that when caught in *déshabille* it is almost always impossible to get either their or their mother's consent to pose for their pictures. It is a residence in a locality particularly adapted to the requirements of the case, and a family-like familiarity with our models that is to give us a successful career in picturesque child photography.

One important element of success in the portrayal of children, for good pictures, is the securing of plump, well-developed specimens. Whenever we see children represented by the earlier eminent artists, we are struck with the largeness and roundness of style. Big heads, ample bodies and full limbs go to make up the beau ideal of healthy child life. The Old Masters seemed to feel that scrawniness ill became child life, and we know well that even with the untutored masses, now, the big, plump child has the interest if not the sympathy of the majority.

The greatest obstacle to success in posing children is the necessity of arranging them at a proper distance, and within a certain space laterally so as to have them in focus and on the plate at the time of making the exposure. All such arrangements which we must make with the camera set up on tripod are certain to bring about an artificial, studied and set appearance, which at once robs the work of that look of accident which is a characteristic of the productions of the best artists. The less genius a painter has the more will his compositions have an appearance of stiffness and studied building up. One would suppose that the photographer, with the ready and rapid means which he possesses for seizing fortunate arrangements, ought to have the greatest success, but this does not seem to be so as yet, and one reason is that nature is rather sparing herself of very choice arrangements, so that we may make hundreds of exposures and only secure but a very few fine pictures. With our own children, about us every day, it is only occasionally that we see them so arranged in every way that they make a fine subject for a picture. Their dress, hair, expression, the light and shadow, the back ground and surroundings, all flash before a painter at once. Think of it! Is it any wonder that we rarely get them all together, without more or less discord in some one? and when it does happen, speak of setting up your camera, and it vanishes



By Xanthus Smith.

We must console ourselves with the hope that the daily perfecting which we see going on in the hand-camera with highly sensitive plates, rapid lenses and improving art knowledge, will be the great factors in highly artistic photography.

The accompanying reproductions are as much examples of failure as of success. In the children at the door the girl happens to be a very fortunate arrangement, both in the disposition of the figure and the drapery, and the boy is good, but would have been better with a picturesque hat and his hair not cropped so short. The disturbing effect is seen of the strong light and shadow of the weather-boarding. If all that sideof the picture beyond the boy could have been quiet, middle tint, it would have been a great improvement, as may be seen by hiding this busy portion.

The wood scene is open to the criticism of the children being too much arranged, but the arrangement is easy and natural. Care was taken to secure as much repose back of them as possible, but if the high-lights on the small leafing could have been subdued it would have been of great advantage.

* * *

SYSTEM.

BY WALTER D. WELFORD.

NO pursuit or hobby affords better opportunities to the man with systematic tendencies than photography. But, except as compelled by the exigencies of business, I fear the majority of photographers are content to jog along in a very hap-hazard do-as we-can-be-bothered style. It is true that when a friend is shown my methods and plans, his first remark is, usually, "what a lot of work," and at first blush it undoubtedly does appear so. Nay, more, there is work attached to it, but on the principle of spending sixpence to receive ninepence, it is work to save work, *i.e.*, to gain the ninepence in "time." And we know "time is money."

It will be advisable at once to state in which direction this article tends. The methods to be dealt with are connected with the numbering of negatives, systematic printing and insertion in albums, and binding of lantern slides. Being quite a hand camera man my system perhaps appeals more forcibly to workers of the ilk. But then a negative is a negative and a print a print, so it must apply more or less to all kinds of work.

Briefly put, I can find at once any particular negative, print, or slide. It is in this that the ninepenny claim is made for the saving of time. However elaborate the work necessary may seem, it is amply repaid by the convenience of reference afforded. There are workers I know who, rather than do the little systematic registration, will spend hours hunting for negatives and prints. They lose time over this and their tempers as well, possibly also damaging the negatives and prints. It is not unfair to ask why a man should handle 100 negatives to find one, when by a simple system he can lay his hands upon that one immediately and without touching others. Some have the idea that to be in any way systematic is detrimental to their artistic feelings, or at all events lowers them in the estimation of others. This idea of an artist is that anything approaching business-like capacities is to be avoided. It is absolutely a false idea. Jones tells Brown in a careless way, "Oh, yes, I have a fine negative of the place you mention, but it's too much fag to hunt it out, don't you know." And if asked for a print, "Oh, I forget where there is one; I never bore myself with these matters; if I get a good print it goes off to an exhibition and gains a medal, but the others I just chuck anywhere." There is no earthly reason why a little system in preserving the results for easy reference should interfere with their artistic qualities.

It must not be understood that I am claiming any novelty whatever for the methods employed; they are the outcome of personal necessity and may be new or old. It matters not to me. Possibly the method of binding lantern slides and framing prints is somewhat new. But, dear me, we never know.

The requirements are as follows:
Grooves for negatives.
Negative register. Ruled quarto book.
Album register. Ruled quarto book.
Printing register. Small memo. book.
Series of albums uniform in style and size.
Lantern slide chart or plan.
Slide binders in various colors.
Small frames ¼ pl. or 5 x 4 sight size.
Cloth covered boards of special design.

NEGATIVES.

All negatives are numbered as soon as dry by sticking a small piece of paper upon the film, on which is written the number. Upon the film is better than upon the glass side, owing to the greater tenacity. Negatives that are doubtful remain until a finished print is ready for the decision as to being worth storage room.

The negative register is an ordinary quarto lined book, and the particulars are given this way:

Trip.	No.	Subject.	Album.
Brussels 1893.	1750	Ostend. Stall in Market Place	25
	1751	“ Upon the Fish Quay	26
	1752	“ Shrimping (one)	26
	1753	“ Shrimping (four)	24
	1754	“ Man on Barrow	35
	1755	“ Looking for Herne Hill	35
	1756	“ Where's Dring?	35
	1757	“ Children	26
Convention 1893.	1758	Boating Trip. The Party	37
	1759	“ Landing	37
	1760	“ The Provisions	37
	1761	“ Carrying the Provisions	37

This is an exact extract from my own negative register. Taking the columns in order, I find the "Trip" a ready means of getting at the place or journey, as the eye catches these separated lines very easily. By "Trip" I mean the whole of the outing, which can always be named in some way. For continuous series, of course, such terms as street, athletic, etc., are used.

In the subject column, a sub-heading is very useful where a good many plates were exposed. Thus upon the Brussels trip, there were plates exposed at Ghent, Brussels, Ostend, Dover, and further sub-headings as "The Party," and "At the Velodrome." The same with the Convention, each place or each incident being arranged together as far as possible.

The column for the album number is the key note to quick finding of the print. By reference to the negative register the album can be found, and then it is the work of a few seconds to find the print. There is a further system to facilitate this, which will be referred to later.

In numbering the negatives, I find a piece of white paper better than scratching or penciling the number upon the film. It is much more easily seen. Scratching requires the negative to be held up to the light, and penciling needs close inspection.

For storage, grooved boxes are the most convenient, stood up on end with the lid opening like a cupboard door, and placed so that they can be each opened in turn without lifting or moving. They are uniform in size, holding 100 each. On the outside is placed a label,

1701–1800

BELGIUM

CONVENTION.

The Prints.

As each one comes out of the printing frame, the negative number is penciled on the back. In doing this a dark portion should be chosen or the marking may show through. Usually, however, there is a more or less dark foreground at the bottom of the print which serves for this purpose very well. The bottom of the print is the best place, but the number must be written high enough up to clear the trimming knife. In whatever way the prints are stored, unmounted, numbers at the bottom will be found more convenient; and in arranging a great number on a table, three or four times the quantity will be managed, as the prints can overlap each other.

The printing register is compiled from the albums, but as the latter are in turn compiled from the negative register I must for the present leave this over.

Any method of treating the negatives so that the number appears upon the print, has the objection that it interferes with enlargements and lantern slides. Moreover, as I trim the prints to suit the subject, in some cases long narrow strips, it would be difficult to decide where to put the number.

The Album Register.

This is a list of the albums and the prints contained in each. The list serves as an index if desired. Here is a sample (extracted from my own) of the list.

21	Volunteer Camp
22	
23	Belgium, Views
24	“ “
25	“ Street
26	“ Various
27	Convention, No. 1
28	“ “ 2
29	Holland
30	Street Scenes, No. 4
31	Street Scenes, No. 5
32	“ “ “ 6
33	Cycling
34	The Thames
35	L. C. Party to Brussels.
36	Cumberland Fells, No. 2.
37	Convention, No. 3

Then as an index it can be arranged this way.

Belgium, 23, 24, 25, 26.
Convention, 27, 28, 37.
Street, 1, 2, 3, 30, 31, 32.

Each of my albums holds 48 prints. A separate page is devoted to each album as follows:

2—

Street Life, No. 2

133	1186	427
139	✓	——
8	1197	739
5	——	✓
74	172a	——
135	169a	869
✓	✓	986
337	332	1012
69	436	1060
70	385	——
84	✓	✓
334	393	1067
333	516	1163
1181	394	1164
1182	429	1167
1185	431	1174

By arranging them in three columns of sixteen we get the 48 spaces shown more clearly, and what is left at the end seen at once. In the sample above the album is complete, but supposing that 1067 had been the last print, it would be immediately seen that four pages were left in that album.

Where there is a ——, is in reality a blank page, and by its position in the list it can readily be found in the album. The tick (✓) indicates a print from a negative that is no more. If a negative gets damaged or is purposely thrown away, its number would mislead, so I adopt a tick, which indicates a print preserved for some reason from a negative that exists no longer.

The System in Practice.

Presuming the worker to be just finished developing the plates exposed during a recent trip, as soon as they are dry he arranges and classifies them, so as to keep certain incidents, or certain places, together. To enter up the negative register is the next task, and after this is done the negatives themselves are numbered.

He next resolves into which album or albums the prints shall go, and writes down the number of the album in the last column of the negative register. If it be a complete trip, probably a special album (or even two) will be allotted. There may, however, be a few that would come better under an existing album. For instance, one of my trips to Torquay resulted in rather over 100 negatives. To make a good job of it, they had to be reduced to 96 (two albums of 48), and upon going over the list I found a few street scenes which in reality might have been taken anywhere (such as an organ-grinder with monkey), and these were placed in one of the street albums. This left the correct number for two albums, which were divided into marine and views.

From the negative register is written up the album register. Then the album itself has the number neatly written in pencil at the bottom of each page, and lastly, presuming he has already got a few of the prints ready, these are inserted, and the blank numbers written down in the printing register. This latter is not necessary, however, in the case of a big batch. It is more of a gap filler, that is, when a printing fit seizes the individual, he can from the printing register find out what negatives to look out to print from.

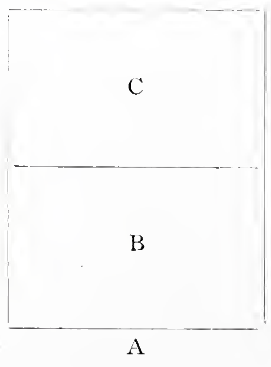
The number at the bottom of the album page is a great convenience. It tells the number of the print that is done, and stands for all time a reminder of the print that is not in the album and ought to be. One or two of my albums I don't care to take up, so forcibly do these numbers appeal for "more prints."

How it is with other workers I know not, but most often do I have to look through my results for some purpose. If a certain negative is desired it is plain sailing. But presume clouds are wanted a good marine shot, then the album is looked through. The number being beside the print chosen, it is only neccessary to go to the store box. If for some particular purpose the negatives themselves are gone through, then it is easy to find where the print is, by the number in the negative register, and lastly the classification of subjects and trips together, enables the worker to see all he has in any one particular direction.

Now the fit is on, let us say. Printing frames are dragged out and negatives are wanted. The worker looks over his albums, and writes into the printing register the numbers required, searches them out of the grooved boxes and gets to work. The only other item is, as I have before described, marking the number on the back of the print.

The albums are better covered with a quiet toned paper upon the fold of which is written the number and title. To save labor this can be written upon a piece of paper and pasted upon the ordinary binding, but the effect is not so good.

My mounting is done by merely touching the four corners with a gum or paste brush, a piece about the size of a pea being ample. As, however, many of our papers have a tendency to curl in the hand, let me mention a ready way of doing a whole album without waiting for each one to keep down. It is done by doing all one side pages straight off, then the other side. If we attempt to do both sides of the leaf at once, it is slow work. The album is held upon the table in this fashion:



The worker being at A, after pasting down the four corners of the print B, without removing his left hand he brings down C until part of it touches the print. Then he removes his hand to top of C, and so the operation proceeds, the pressure not being removed at all. He will find it easy to keep the palm of his left hand on the album all the time and yet use the fingers to hold the print for pasting. The right hand of course is free all the time to manipulate the prints, brush, etc. The main point is to always bring another and empty page down upon the one on which is the print, rather than turn over the filled page to an empty one. It is wonderfully simple in practice, but a perfect terror to describe in print. Having completed all one side, the other is done in the same fashion.

I will briefly summarize the advantages of the system which takes a good deal of description, but when done fairly regularly entails no great labor.

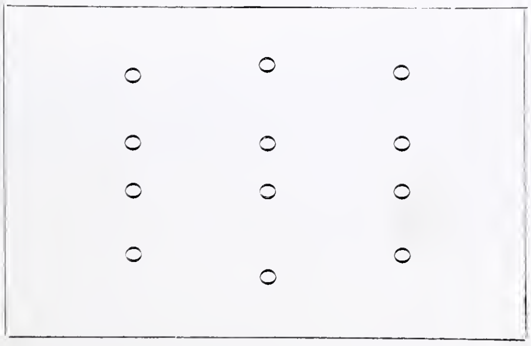
1. The negative can easily be found.
2. The print the same, or
3. There is a constant register of the prints required.
4. From the negative the print can be found and from the print the negative.
5. Subjects or special directions of work are traceable through the albums.
6. Wherever a print may be, whether unmounted or in album, it bears upon it the number.
7. Negatives after printing may be readily put away.

Frames and Framing.

This has in reality no connection with the prints and negatives, but as I have thought out a very convenient method of framing hand-camera prints, it comes well within the scope of this article, as it is distinctly a system.

The matter arose out of the necessity for ready changing of prints to meet the different classes at exhibitions. All the credit for using separate frames and mounting six or more on a board I unreservedly accord to Mr. Austin Edwards. But his were firmly attached, whereas mine are very readily removable.

A series of boards each 24 x 18 inches are first procured, which are pierced with holes, as shown below:



These holes must be at least ¾ inches diameter. The above board is arranged for two upright pictures in the centre, but of course it can be arranged as desired. The boards are then covered with cloth of a quiet shade, that known as art serge being eminently suitable, and cheap. After the cloth is stretched and tacked or glued at the back, a knife is used to cut through the cloth at the holes. Each frame has attached at the back two eyelets of sufficient size and length to reach through the holes to the back. A piece of wood is inserted crossways and the eyelet turned until tight.

In this way each frame is held securely, and in the event of their not being straight the circular hole gives ample play to move the frame from the front.

To take off a frame, all that is necessary is to loosen the piece of wood by turning; then remove it from the eyelet and, *voilà tout*.

Lantern Slides.

The mournful color of lantern slide binding must be due to custom surely. The only merit gained is perhaps that of cleanliness, and yet black paper shows dirt after all. The black binding of slides always seems to me to make a sort of invitation cards to the funeral of Mr. Optical Lantern. Why do we stick to black? It cannot be written on except with white paint, and any inscription upon the top needs to be pasted on. It may be thought that colored binding is more easily soiled, and has too gay or gaudy an appearance. In my experience, however, it lasts quite as well as black, and as for its gaiety, why shouldn't a slide be pretty? There's quite enough trouble in the world without putting every lantern slide into mourning.

In addition, however, to the advantage of being able to write upon them with an ordinary pen and ink, colored binders give another great power, that of arrangement and classification by colors. Some three years ago my slides increased to a number that entailed considerable labor each time of reference. Getting out the slides for a lecture took up far too much time, and I promptly sought a remedy. It was found in the use of colored binding, and now my (about) one thousand slides are as easy to look through as one hundred were before. System again. More system, more work, 'tis true, but the advantages gained must be seen to be believed.

By a series of colors, which I term body colors aided by small pieces placed at the end, it is possible to cope with an enormous number of slides and to classify minutely.

The first thing required is the slide chart or plan. Mine is a fourfold card, which opens so as to display the complete series at a glance. Eight colors in the binding, sufficiently distinctive to be compared even by gas light, gives sixty-four classes or subjects. The chart is made by ruling sixteen spaces upon each fold.

Belgium	Orange.	
West of Scotland	Orange	Blue
Cloud Studies	Orange	White
Animals	Orange	Green
Humorous	Orange	Black
Our Camp	Orange	Pink
Volunteering	Orange	Red
Haymaking	Orange	Yellow
Cumberland Fells	Pink.	
London	Pink	Blue
Coventry	Pink	White
	Pink	Green
	Pink	Black
Birmingham	Pink	Orange
	Pink	Red
	Pink	Yellow

It is difficult to describe the chart without the colors. The first column contains the name or subject; the other columns in the above sketch are, in reality, pieces of the binding pasted down opposite the titles, with the small pieces on the ends. But without the colors I have had to use words. These, however, are not, of course, on the plan; in other respects the sketch is an exact copy of my own chart.

Now a hint in setting about this work. Make the classes or subjects containing or likely to comprise the most slides in the plain colors,—body colors as I term them. The reason of this is, of course, evidently to save putting on the extra pieces.

In binding up the slides, the body color is all that is necessary and only needs the separation of the subjects. Thus at least eight subjects (in my sketch) all go under orange and are therefore bound up together. The little pieces can be put on later.

Some may be hindered from considering the system because they have a number of slides already bound. But that is easily got over by sticking a piece of the proper color *on the top only*, as it is by the tops that the selection is made, whether the slides be stored in grooved boxes, or (as mine are) simply against each other in shallow drawers or boxes.

I have found that any varying series of numbers, such as London 3, Belgium 20, and so on, a perfect nuisance, and therefore adopt the negative number throughout. This is written on the mask. Upon the top is written the negative number again, and title of the slide thus:

1203 Flower Girl.

In finding slides, if there are many divisions, a glance at the chart will show the correct color or combination, and then along the tops the number or subject. I should add that I store all the same body colors together.

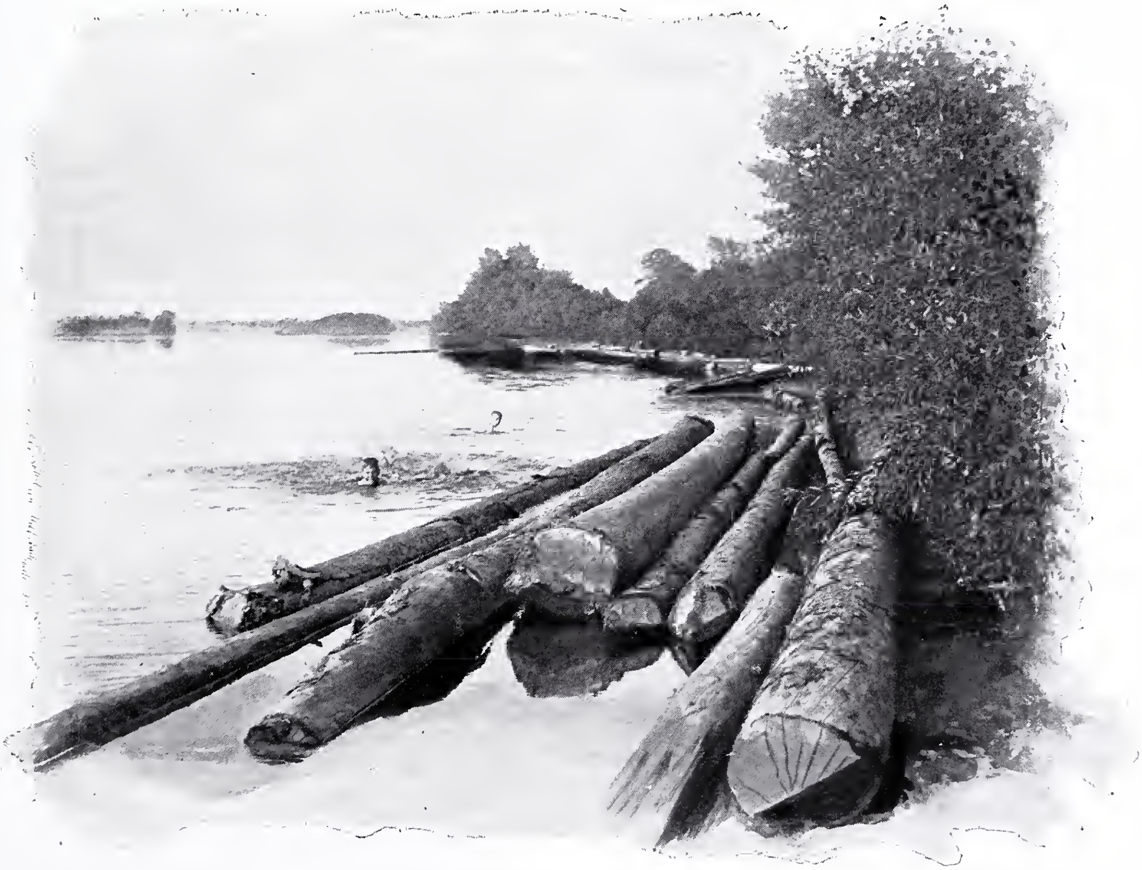
In conclusion, I assure readers that what may read like an enormously laborious system is in practical work perfectly easy when done fairly regularly. I have given my own methods, and do not intend to point out the various alterations and additions that can be made in the system. This, each reader can do for himself, if he so chooses. If 'tis nothing new, 'tis useful.

PHOTOGRAPHY APPLIED TO BOOK ILLUSTRATION.

BY MAX MADDER.

PHOTOGRAPHY is now very largely employed for illustrating books, magazines, etc., and attempts have recently been made to extend its use in this direction.

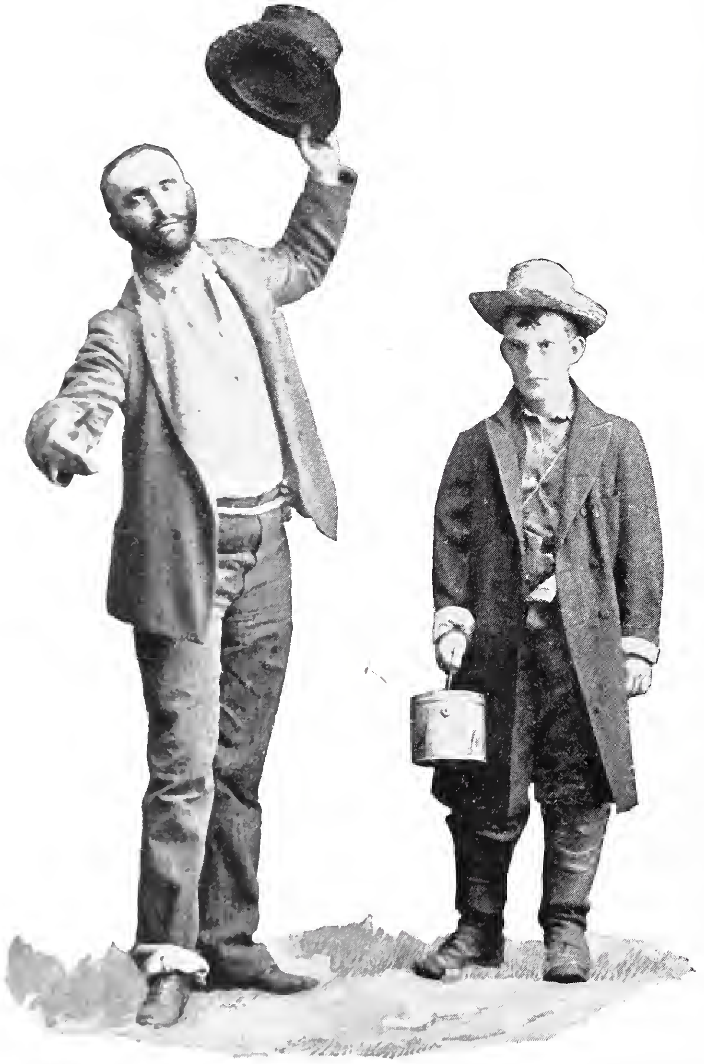
In works of travel the camera is no doubt superior. It gives a more truthful representation of the scenes, and has already been the means of proving many of the pictures of far away places to be very much overdrawn and a good deal the result of a too imaginative artist. For scientific works, and other similar kinds of books, photography gives us the same advantage. But quite recently attempts have been made to illustrate works of fiction, these attempts resulting successfully in a few cases, but as a rule in dreadful failures. Where landscape work is concerned, there is undoubtedly a large field open to photography as an illustrator. The cost of making a photograph is considerably less than the production by a good artist of a drawing of this kind Even when a few figures are included it may be done judiciously and with success. Take, for instance, the illustration on this page, "In Swimming" from "The Farmer's Boy." The text to which this picture refers is a description of some boys who on a hot summer day go down to the banks of the river and there take a plunge into the cool waters. The illustration leaves hardly anything to be desired. It fits in and embellishes the work. An artist making a picture for the same purpose would no doubt have made a more humorous one, the subject lending itself for this purpose; but then again it is often a question of cost, or else the author has a fancy to illustrate his own work, and not having the technical education which will enable him to use the pencil or brush he naturally falls back upon the camera. I give two other illustrations from this same book on pages 267 and 268.



From "The Farmer's Boy." D. Appleton & Co.

FIG. 1.—"IN SWIMMING."

These are the best I have seen of this kind. The photographer has had the good sense not to make the subjects too prominent. In reading a story in which certain good or bad characters are described one unconsciously forms their portrait in one's mind, and with many books illustrated by artists a disagreeable sensation is experienced in viewing the pictures. Our idealized hero or heroine is there depicted as a creature far different from the one that we had pictured in our minds. Take, for instance, the book that, for some unaccountable reason, is sending the whole world crazy—"Trilby." It is a good story, although there are very many better ones that have never become so popular, but in my opinion it is spoiled by the illustrations.



From "No Enemy but Himself." Messrs. G. P. Putnam's Sons.

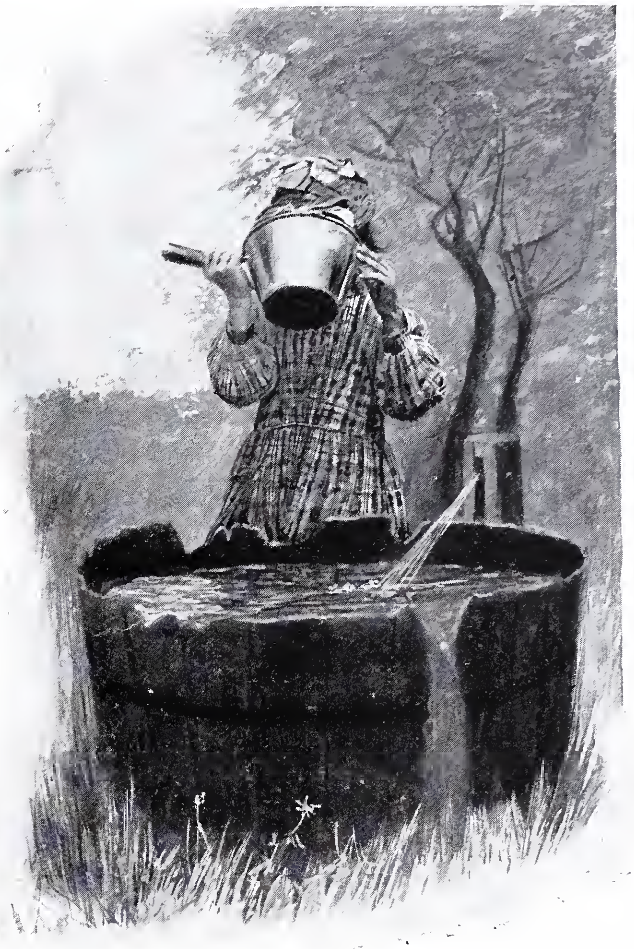
"AH, I AM PROFESSOR BOCCACCIO."

I could have read that book and I would have known Trilby. I would have pictured her in my own way and to my satisfaction. But look at Du Maurier's drawing of her—the same woman that has illustrated all his society jokes in *Punch* for I don't know how many years. The same insipid, lifeless features and the same formal aristocratic bearing. It is a shock, and my interest in poor Trilby received a blow from which I never recovered. The woman as drawn by Du Maurier's pen one imagines to be a very different style of woman than that depicted by his pencil.

If, then, the artist experiences so much difficulty in illustrating a work of fiction satisfactorily, how will the camera act. As I have already said, with a certain class of illustrations, it serves every purpose, but I have never yet seen any successful figure studies either help the story or improve the appearance of the book. In a work recently published entitled "No Enemy but Himself," there are a number of illustrations produced by the camera. I give one on this page. The story describes the life of a tramp who picks up in the course of his wanderings with a little boy, and they journey along the highway together. The tramp is a very amusing character, and the story is well told, but the illustrations might easily have been dispensed with. When action is intended, as in the picture given, the pose is stiff, unnatural, and there is a consciousness exhibited by both characters that they are being photographed. One can almost hear the photographer saying, "Now keep still, please." The type of man selected to illustrate the tramp is widely different from the kind one imagines on reading the story. The picture, "Go on, I am Listening," is the best in the book. The old lady is a good type of character, and is photographed practically at rest, wherein lies the secret of success. If a book is to be illustrated by the camera the photographer must choose such parts that require no attempts on the part of the model to represent action, for in the majority of cases the result is only a ludicrous effect resembling one of the photographs illustrating plays showing the actors and actresses arranged in some striking scene. The effect is always absurd to me, and gives one a very poor idea of the play and of the actors therein. I contend that there is a large field open to photography for book illustration, but I do not like to see it abused. There is such a very narrow line between the sublime and the ridiculous that one cannot employ it without serious thought and consideration if good results are required.

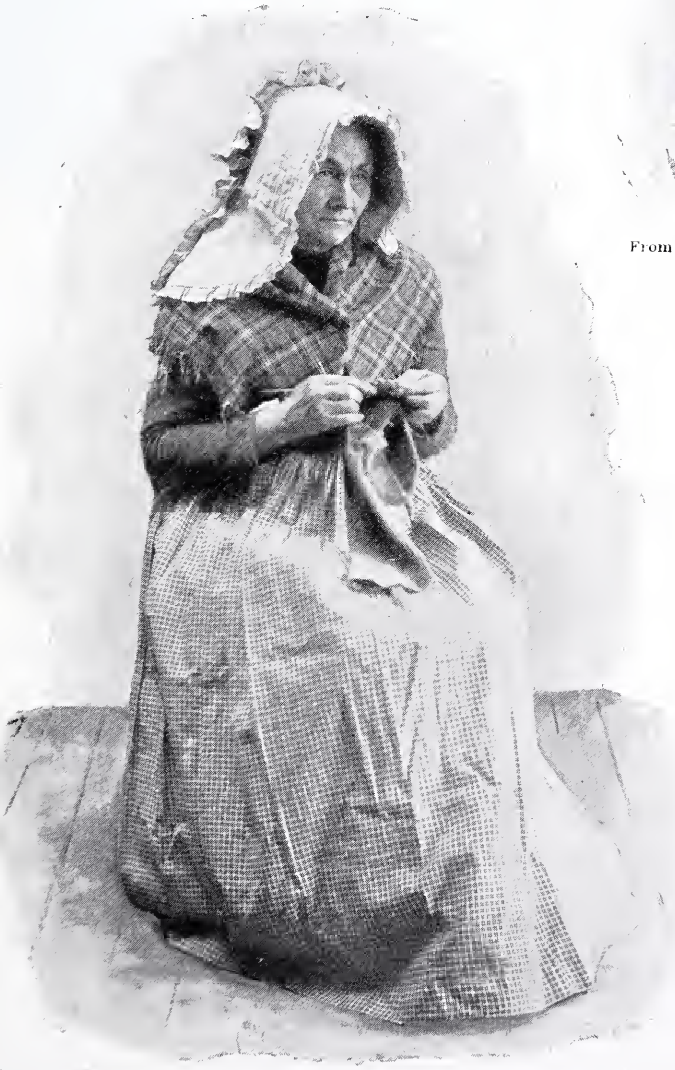
The selection of suitable models for figure illustration is the most difficult, and if one were really to do this conscientiously, and take proper time and trouble to hunt up and select characters that would be suitable, the cost would in the majority of cases far exceed the price that would be demanded by the best artist alive to-day.

I have often noticed a splendid face of a certain character, and would have given anything to have been able to make photographs of it, but, alas! I am a very modest man and I don't possess enough courage to make the request. Others are more fortunate than I; they would have no hesitation in stopping a man in the streets and saying: "My dear sir, will you allow me to make your photograph? you have an ideal face for 'Shylock' or 'Fagin.'" And such men sometimes succeed in getting characteristic pictures, especially if the model be a good actor. But the attempt to illustrate a book in such a way would be a thankless task.



From "The Farmer's Boy." D. Appleton & Co.

FIG. 3.—"A DRINK AT THE TUB IN THE BACK YARD."



From "No Enemy but Himself." Messrs. G. P. Putnam's Sons.

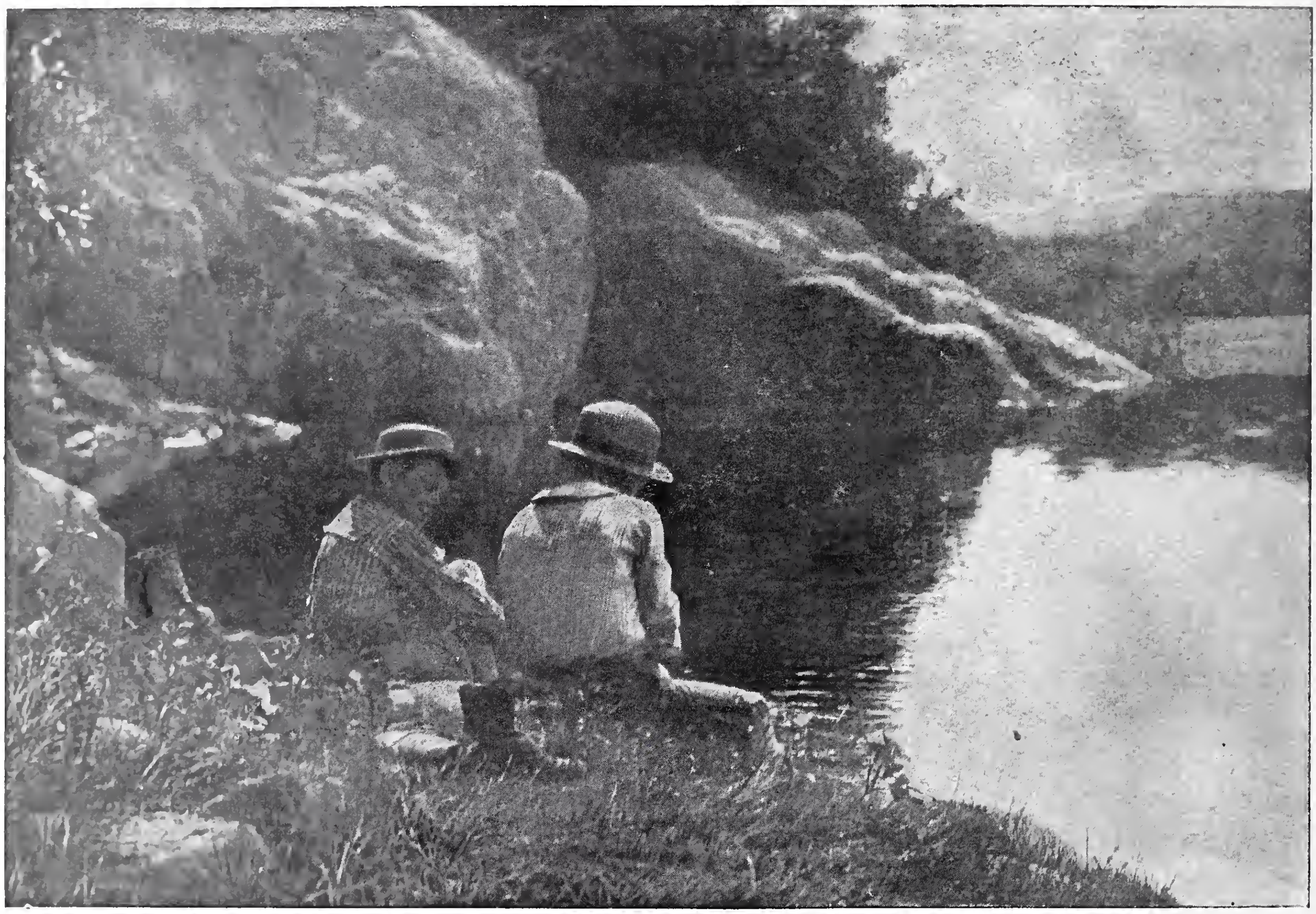
FIG. 4.—"GO ON, I AM LISTENING."

Even if suitable models were found, every one knows the difficulty of taking an ordinary group, but to pose a number of persons, or even two, in attitudes descriptive of certain passages in the book is a fearful undertaking, and ninety-nine times out of a hundred the result resembles a picture of stuffed mummies. Tell a man to smile before the camera and he will look like a fit subject for the nearest lunatic asylum.

The difficulties in the way of utilizing the camera for illustrating novels are undoubtedly very great, and although the experiment is often tried with more or less success, chiefly less, I think, the time is very far distant when it will be utilized to any great extent.

Photography is now being used very largely by sensational papers, who pander to the taste of the low-minded class, and for this purpose they have in their own way been very successful.

Some of our comic papers have also employed photography for illustrative pur-



From "The Farmer's Boy." D. Appleton & Co.

FIG. 5.—MEDITATIONS BY A STREAMSIDE.

poses. A series of humorous biographies of popular persons, appearing in *Life*, is cleverly illustrated by combinations of photograph portraits and black and white drawings. In most cases, only the head is a photograph, the rest being added to give a comical effect.

Books of poems have been successfully illustrated by the camera, where figures have not been employed. Attractive and well-executed pictures of country scenes, brooks, old mills, etc., often lend an additional charm to a poem upon such subjects, and can be obtained with little trouble and expense. For this purpose the photogravure process is, of course, the finest. If this is too expensive, half-tone cuts must be employed.

I have recently seen some well-illustrated books published in France. Vignetted photogravures were distributed all through the text, and the effect was very fine indeed. One of the books was a story by Daudet, illustrated from life. The chief characters depicted were a number of monks, but it was evident from the clever expressions and attitudes that good actors had been engaged. The accessories had been most carefully chosen, and the effect was good in every way. Indeed, this is the best specimen of this class of work that I have seen.

Those who would like to try their hand at illustrating may be interested to know that Mr. Mendel, a well-known publisher of Paris, is offering a prize of one thousand francs ($200) for the best series of photographs from nature, illustrating the text of either a fable, legend or novel by some well-known author. September 15th is the date of closing of this contest.

* * *

PHOTOGRAPHY AS AN AID TO EDUCATION.

BY ELLERSLIE WALLACE, M.D.

ANY attempt to definitely settle what is necessary and what is not, in general schemes of education for the ordinary man of the world, is of course impossible. But, nevertheless, it frequently happens that things very useful to know are learned during the pursuit of objects irrelevant to one's chief calling in life; or even in some cases the secondary employment will become the educator in chief, while the principal matter falls off owing to bad instruction, unfavorable environment, and many other causes.

I am well satisfied that, among the great armies of amateur photographers now actively pursuing the art, there are many who find themselves constantly learning new, useful and curious things. I also know well the lessons, and hard ones too, that the plodding professional man has to learn and lay to heart. "In the sweat of thy face shalt thou eat bread" is at least as applicable to the active pursuit of photography as to any other calling, I care not what it may be.

Among my own experiences in the art, which date back to early collodion days, I have found that I have unconsciously formed habits of order and method in any kind of manual labor in which I may be engaged—not only when working with the camera—but the habit of photographic neatness is carried over, so to speak, into other things. If I am to work at all, I *must* have my implements in good order, and kept about me in an orderly manner. Dark-room cleanliness sticks to me in spite of everything; nothing is so disagreeable to me as the sight of dirty glass or china ware. In fact, if I were asked what means to adopt with a child who had difficulty in forming orderly habits, I should recommend his or her being made to do some photography just for the sake of teaching how much depends upon order and neatness as opposed to slatternly carelessness. Order is "heaven's first law," as we have before heard.

It almost goes without saying that such habits go hand in hand with *patience*, which is another most valuable trait of character. If we pause long enough to consider the literal meaning of the word patience (suffering or enduring), we learn another lesson from photographic manipulations, which certainly require this quality of mind or disposition in a high degree. I have had almost every variety of failure known to the photographic workman—at least those traceable to my own shortcomings. But I never have gone so far as to journey to Alaska or all around the world on a photographic trip, and bring back several thousand exposures, from which not so much as a presentable picture resulted. But I have stood by the operator in the dark-room who was developing nothing but failures caused by a leaky camera or defective films which had been transported by some wealthy and untrained amateur on long trips, such as I mention. I am glad that I was not present when the piles of spoiled tissue were presented to the amateur traveler as the result of his photographic labors when far from home. The *verbum sapienti* here, is to see to the cameras and holders before starting, and be also sure of the films and of the exposures required.

For those numerous classes of persons who have a fondness for mechanical pursuits, I can think of nothing more pleasant than the planning and construction of cameras, tripods, and other photographic apparatus. This is not the place to give instructions in the matter, but I may say that I have passed many a restful hour from severer labors in working at the cabinet-maker's bench to enrich my stock of photographic sundries. Chemists who delight in accurate analyses will find enough to keep them fully occupied if they take up the study of dry-plate manufacture. I do not mean, of course, to do such a thing on the large scale; but it is easy to fix up a drying closet in the dark-room and arrange a leveling-stand for the coated plates out of the marble top of an ordinary bureau or wash-stand. The journals devoted to our art will furnish any number of good formulæ for preparing the emulsion slow or rapid, and thus long winter evenings may be profitably spent in learning the "true inwardness" of photography. When I look back to my own early experiments, I can truthfully say that I greatly enjoyed them, and benefited from them, even in spite of numerous failures. I think that our modern amateurs would really enjoy themselves more if they did more of the work with their own hands. This would teach them *practical photography;* and if failures occurred they would know how to search for the causes in a more intelligent and scientific manner. The time spent in such experimenting is not lost.

Among my numerous photographic friends I have one who actually fitted himself out with a machine for *lens grinding*. He made himself various combinations of lenses, and is an authority on photographic optics. I mention this just to show what a clever man can accomplish in the more recondite paths of those sciences which are allied to photography.

Turning to the more artistic sides of the matter, there is an unlimited field for those who are fond of the "pictorial make-up" of the picture rather than the mechanical. A photograph may or may not be a picture in the artistic sense, and it will easily be seen who is the artist and who is not when work is exhibited before societies or in public. Almost every principle of practical art may be applied to photography.

Electro Tint Engraving Co., N. Y.

BLANCHE WALSH.

FIRST STEREOSCOPE IN CONNECTICUT.

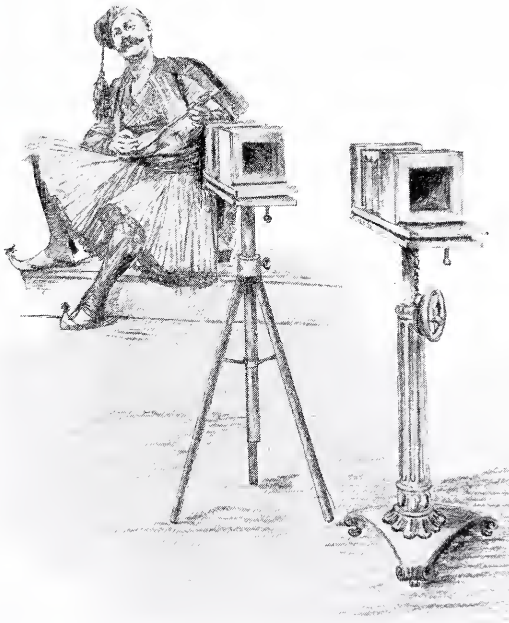
BY R. D. O. SMITH.

WAY back in the early fifties, I went to the gallery of Major Moulthrop, in New Haven, Conn., to learn the art and mystery of making daguerreotypes. Perhaps some who read these lines may remember this pleasant gentleman. To me he was not only a pleasant gentleman, but he was a painstaking teacher, and always a good friend. After that I bought out a gallery in Hartford, but in the course of a year or so I fancied the chemicals affected my health and I sold out and retired from the business. My active exercise in this branch of art was, therefore, not of long duration, but my interest in things photographic has never ceased, and since a time which antedates the gelatine dry-plate I have been a dabbler again.

During the year I was in Hartford the stereoscope began to attract attention. Indeed I think it had been first made photographically within a year or so. At all events it then first attracted my attention, and although I did not immediately understand the mystery of it, I soon found out the required elements of practice. In looking back to that day, it seems strange that there should have been any mystery about it, but, as a matter of fact, few understood the whys and wherefores, and the most absurd explanations were propounded. I suppose somebody had made double cameras by that time, but who, I do not know. I know, I had no double one, nor did I have two of one size. I had, however, several cameras of different sizes, and after trying a few times to get a successful double shot by moving the camera, refocusing, etc., while the sitter remained immovable, I concluded to rig a quarter and a half sized camera for simultaneous action. This I did by setting the small camera some three feet nearer the sitter than the large one. In this way I produced images of the same size on the glass, but I could not get them quite near enough in range, because my small camera was too large for that, and, moreover, it had to set aside far enough to be out of the field of the larger camera behind it. The usual distortion, due to too much angle, was present in my first pictures, but otherwise they were completely successful. They were the first stereoscopes made in Connecticut, and in fact I think not many had made any in the United States prior to that.

I made quite a number for citizens thereabout, and I exhibited about a dozen at the State Fair, held in Hartford that year. They attracted considerable attention, and elicited newspaper comment, and a silver medal was awarded me for Pereoscopic pictures.

These pictures were, of course, made on daguerreotype plates, ⅛ size, and required a special case. The mat had two openings, and inside the cover of the case there was a flap containing two small lenses. When the picture was viewed, the flap was raised parallel with the pictures, and the whole held before the eyes, with results always startling at first sight.

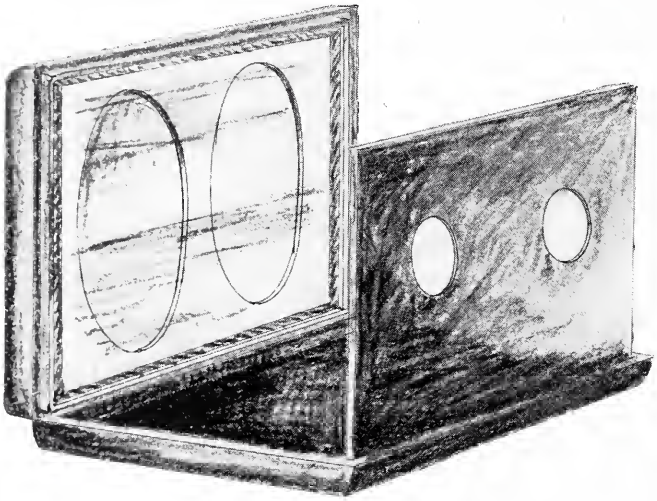


MY FIRST STEREOSCOPIC ARRANGEMENT.

My exhibit consisted of a number of these pictures mounted on a little platform, and with the flaps and pictures held in proper position by a silver-plated brass wire. When the fair was over the plating was invariably gone at a point about 2 inches below the lenses. If I had thought of it, this would have furnished a basis for ascertaining the average length of the Connecticut nose, and possibly I missed an opportunity to become famous and an authority on Yankee noses.

The prismatic lenses and eye-pieces now

common in the instruments for viewing stereoscopic pictures had not then been invented, nor would they have been convenient for use with heavy daguerreotypes, and the size of available pictures was therefore restricted. One interesting thing I found out about that time—that the eyes can be trained to dispense with lenses. It required a little effort at first, but it is not difficult, especially for young eyes, to look straight ahead, independently, on parallel lines—or even on diverging lines—so that when the double picture is held in front one eye sees one picture and the other eye the other picture. This training is a great convenience, as it renders one independent of instruments, and the picture becomes the more real and interesting.


A DAGUERREOTYPE STEREOSCOPE.

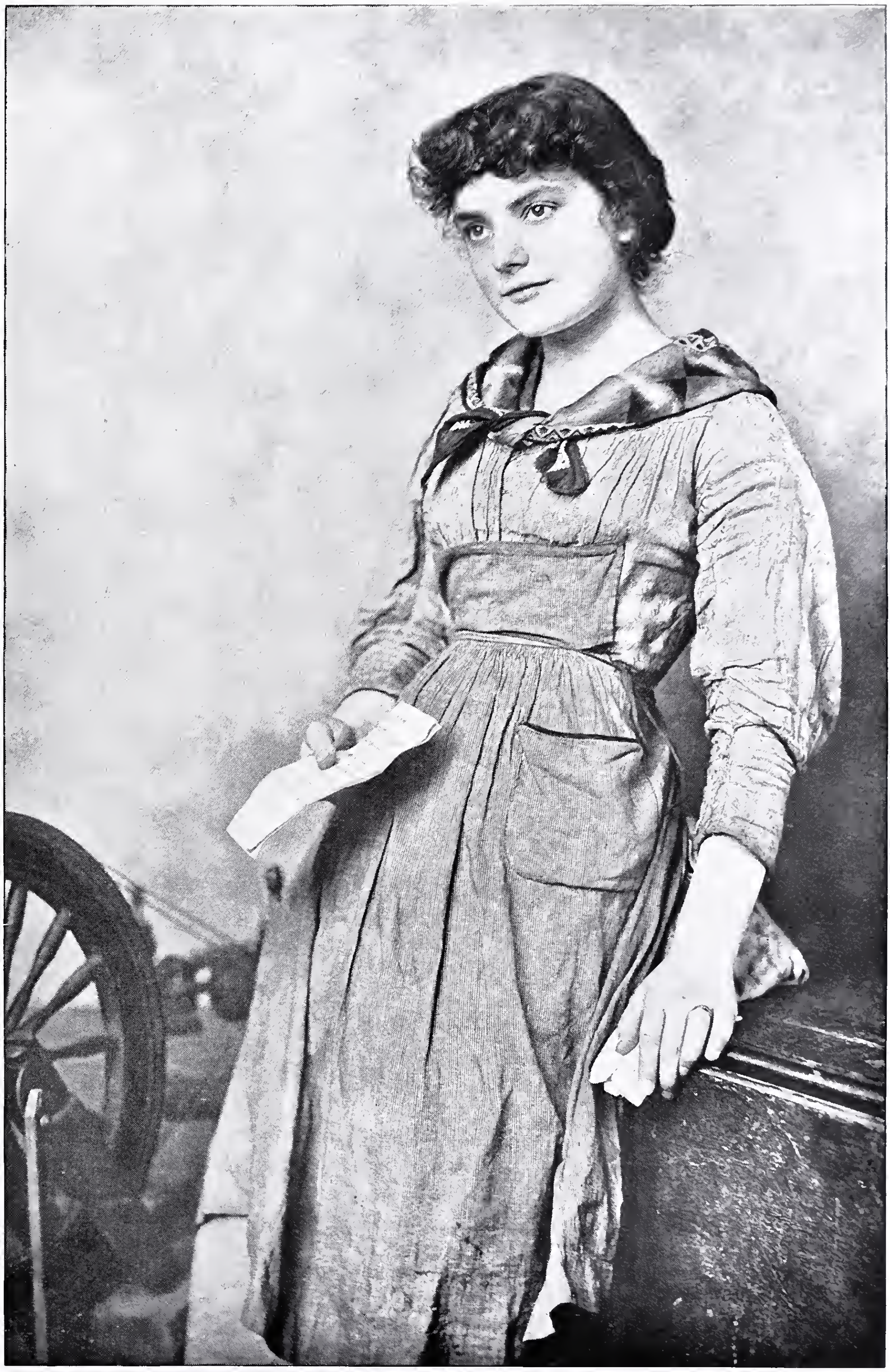
When the eyes are learning or are a little out of practice, the sensation is quite curious. The first appearance is of four pictures dancing in a tantalizing way before the eyes. Gradually the two inner ones will approach and recede, will overlap and slide around over each other, approaching almost to coincidence and then giving it up, until the muscles of the eyes get tired and you give it up. But it don't stay given up. You try again, and finally the lines coincide and, like a flash, the reality stands before you between two dimly seen pictures at which you are in reality looking. This effect is very curious—before your eyes are two pictures and between them is the carved reality. The eyes while in this parallelism may *apparently* be focused on either of the side pictures, but it remains a flat picture, while the combined picture in the middle retains its rotundity while the eyes are apparently turned away from it.

During that year daguerreotypers were beginning to fit up for making glass negatives. My friend Moulthrop showed me his outfit and invited me to come and learn the art, if I desired, free of charge; but I had decided to sell out, and did not avail myself of his offer.

The photograph soon displaced the daguerreotype because of its facility for duplication, but I think all the old timers will agree that, for real intrinsic beauty, the daguerreotype has never been excelled among sun pictures.

* * * *

SHEEP. BY CARL GREGER.



Electro Tint Engraving Co.

THE LOVE LETTER.
BY ARTHUR BURCHETT.

PHOTOGRAPHIC REPRODUCTION PROCESSES.

THIS is undoubtedly the age of illustration. One has only to compare a magazine or daily paper of to-day with those issued but a few years ago. The possibility of being able to reproduce an illustration in a morning paper of a scene happening the night before would then have been voted as absurd. But such facts are nothing to-day; and evening papers will often issue an edition containing sketches of events that occurred but an hour previous to the printing of the paper. Looking at the matter from a critical point of view, we cannot help thinking that the art of illustrating is being dreadfully overdone. The most popular magazines of today are those which fill their pages with pictures of all kinds, many of which have no reason for their existence. The public demand them, however, and the great law of supply and demand comes into play. Thanks to photography the quality of the illustrations has undoubtedly improved. The inferior wood engraver has been driven from the field, and the artist has rarely cause of complaint in the transference of his picture by the camera to the printing plate. The various methods of making printing cuts by photography may not be known to some of our readers. By the kindness of Messrs. Louis Barta & Co., of Boston, Mass., we are able to give some excellent examples of the various ways a portrait is reproduced. In Fig. 1 we have a plain outline sketch suitable for ordinary newspaper work. This is made from a pen and ink drawing made much larger than the original, and reduced to its present size in making the zinc etching. Outline sketches of this kind are often made by using a plain untoned silver print. With a pen charged with a black ink, insoluble in water, the outlines of the photograph are traced. It is then immersed in a bleaching solution; bichloride of mercury, for instance, and the photographic image disappears, leaving the outline pen and ink sketch, from which a photozinc block is made.

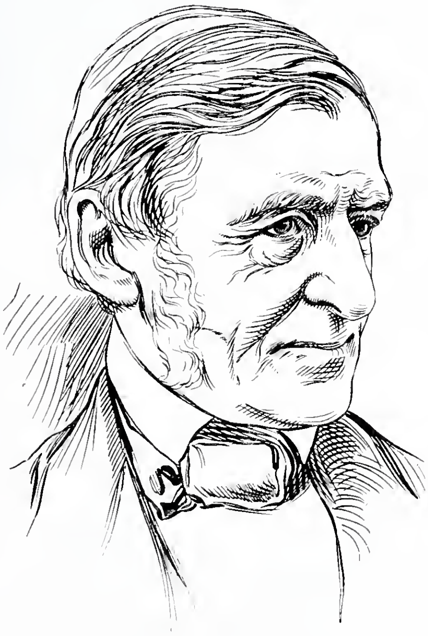


FIG. 1.—OUTLINE.

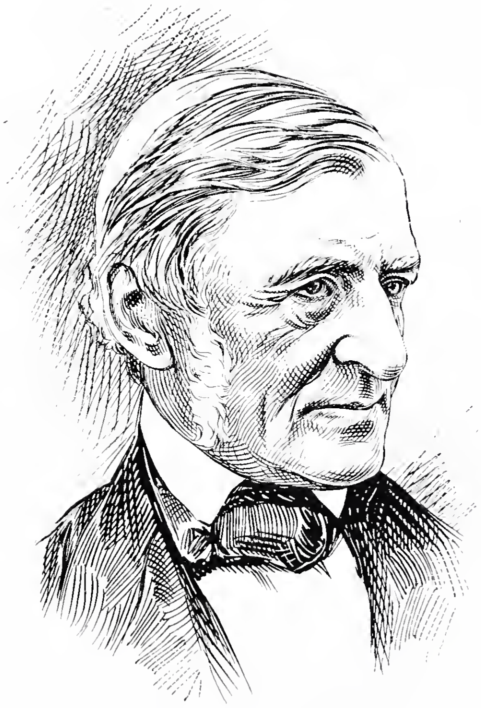


FIG. 2.—HALF SHADE.

Fig. 2 is made in the same way, but is somewhat improved by a little extra hand work on the sketch.

Fig. 3 is still better finished, the cost being about twice that of Fig. 1.

The next illustration, Fig. 4, shows a coarse half-tone for use in illustrating a magazine when the paper used is not of the very best quality.

Figs. 5 and 6 are half-tones made by means of a fine line screen, Fig. 6 being vignetted to imitate a wash drawing background. Cuts like these require to be printed on supercalendered or coated book paper the same as used in this magazine, otherwise the delicacy would be lost.

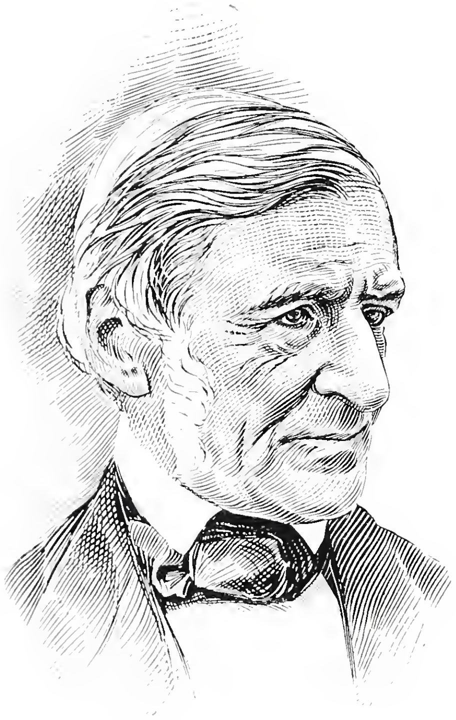


FIG. 3.—FULL SHADE.

We have thus endeavored to give a brief description of the various methods employed to reproduce a portrait. The style adopted will of course depend on the quality of the magazine and the method by which it is printed. Many of the half-tone cuts illustrating THE PHOTOGRAPHIC TIMES are made with the very finest line screen, *i.e.*, 175 lines to the inch.

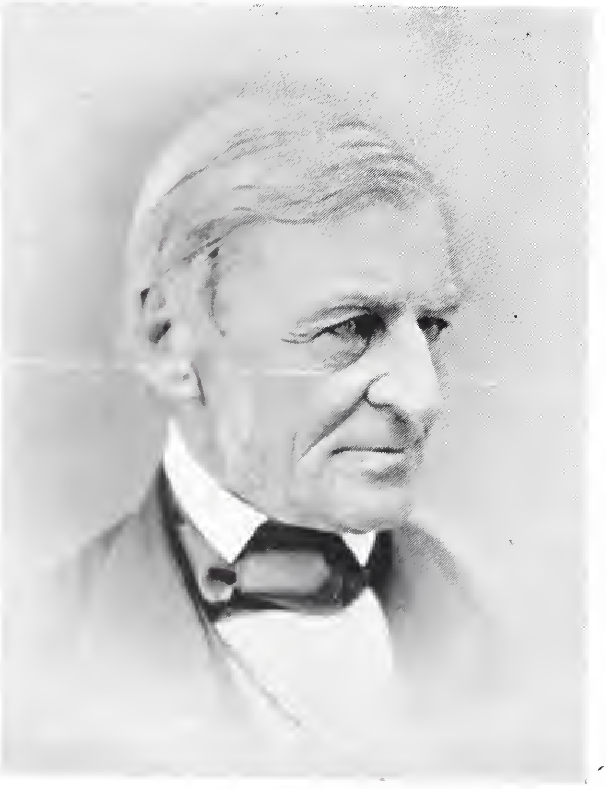


FIG. 4.—COARSE HALF TONE.

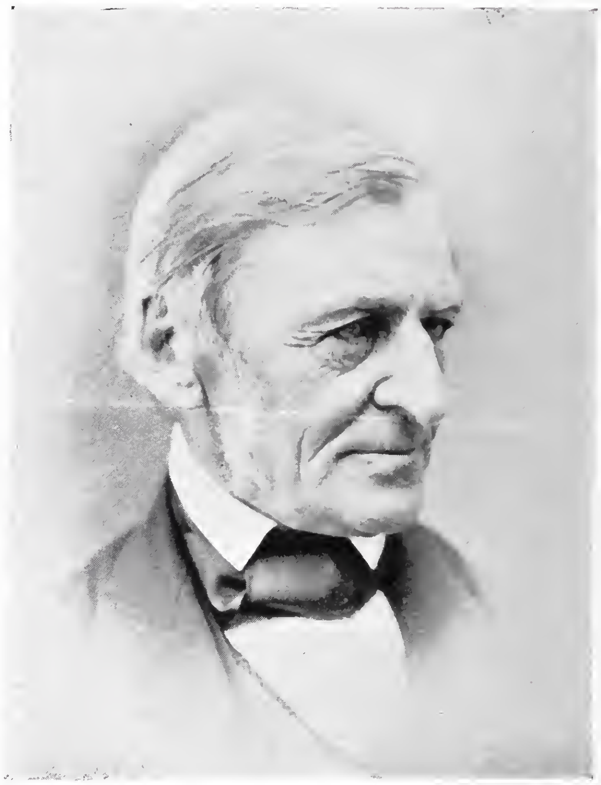
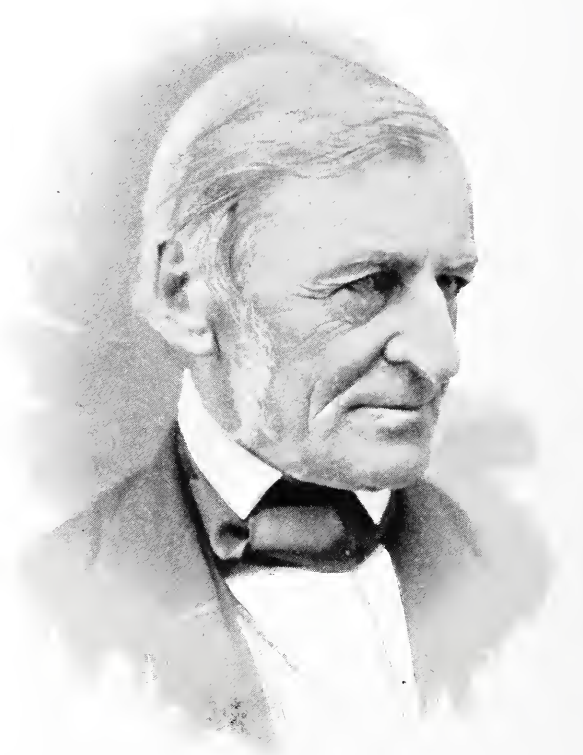


FIG. 5.—FINE HALF TONE.



The machine used for printing is, however, one specially devised for the purpose,

NOTES ON ENLARGING.

BY A. R. DRESSER.

IN my article upon this subject, which appeared in the last issue of THE PHOTOGRAPHIC TIMES, I described the various ways of enlarging, developing, etc. I will here offer a few remarks on each method of enlarging.

If one only uses ¼ plates for enlarging, much the cheapest and best way is to do the work by artificial light with an enlarging lantern, and use incandescent light for so doing, as it is easy to use, cheap, and always gives an even light, so that when once the exposure is found out with a given negative it is always the same, and one can work any time day or night by making a suitable room. It is a good plan, when enlarging, to use a single back (or slide) to hold the bromide paper (up to 15x12), as then one can, by closing the slide, do double printing (viz., printing in clouds), or combination printing with ease, as he can replace his negative with others, and so on without any fear of fogging the bromide paper. I strongly advocate the use of a slide in place of pinning the paper on an easel, as the advantages are many and will soon be found out by those who try it.

When enlarging from ½ plates or over, then daylight is the cheapest and best, as to do so by artificial light would be very costly, as one would require a large condenser (of course I am speaking for amateurs, for, as a rule, to those who enlarge for a business, the first cost is nothing). I take it, as a rule, that the remarks I have made will be of use to amateurs and others who wish to learn (not to those who know as well as I do), and so I *strongly* advocate the use of a ¼ plate or 5x4 camera and then enlarge to size required, as one is able to get as good results up to 15x12 as if he used a camera of the same size, as I think I have shown, such as during the last two or three years I have been exhibiting (with great luck). I have never exhibited a contact print, all the work shown being 8x10 and 15x12 from ¼ plate hand camera negatives; therefore, I advocate the use of a ¼ plate or 5x4 and enlarge to size required.

One point in favor of enlarging I have never seen pointed out, namely, the advantage in composing your picture, to say nothing of the dodging. How often you see pictures printed from a large negative the full size, *because it is all on the plate*, when by cutting off a part of foreground, or else part of sky, etc., a poor picture could be made a good one. Now, when enlarging, by a little patience and knowledge, this can be stopped, as one makes the enlarged picture larger or smaller, moves to right or left, and so on, till he gets the image on the screen to his liking; he can add or reduce the foreground or sky, or can, in fact, make the picture to his liking, and if one has any idea of Art he is able to reproduce a picture from a negative that if printed just to contain all that is on the plate would only be a photograph and not a picture

Many may say, What is "Art" in photography? I cannot spend time to explain my meaning clearly, but, to put it in a few words, Art is what pleases the eye of the person who sees Art in a picture. Luckily no two think alike on Art or we should have all pictures just alike, which would be as bad as one Religion, or one side only in Politics, and certainly when painters cannot agree we can hardly expect photographers to do so. If one produces photos he can look at for days with *pleasure* that is all he requires, and is Art to him.

Now I consider what I have said a great point in favor of enlarging; another great point in its favor is, one can do dodging so easily, or print in clouds, etc., if one side of the negative requires a little more exposure than the rest of the negative, by cutting or tearing a piece of cardboard to shape required and giving that place more exposure; further, one can easily print in clouds. I find many who think that it is a great trouble to print in clouds on bromide enlargements, but it is not so; it is no more trouble than doing so on silver paper, only it is quicker and has to be learned; but once one gets in the way of it he will never fail. It is here where a dark slide comes in to such advantage, and I will try to explain how it is done. I know it is hard to make my meaning plain in writing, but could do so in a minute in my dark-room.

Take your negative and compose your picture just as you want it; choose a sky negative that suits the subject, then place in your bromide paper with the subject of negative in its place for enlarging; cap your lens and give exposure required for the subject, say, for example, 60 seconds, with another fairly good negative. Now cap the lens and close up your dark slide; uncap, and with a piece of chalk mark the line where foliage joins the sky, then put in your sky negative and get it in position so that the bottom part of sky negative you wish to use just joins the line marked on dark slide with chalk; now recap the lens, take a piece of thick cardboard large enough to cover well the size of enlargement you are making, then draw out slide and expose, say for 20 seconds or 15, moving the cardboard up and down *fast*, so as to vignette the sky line and leave no mark of where the sky joins the landscape. I am afraid this is rather a poor explanation, but it will give an idea, and after a few trials one will soon learn how to do it. The chief point is to learn by experience, in looking at your negatives, the difference of exposure required between your sky negative and subject negative, and always be on the safe side by giving your sky negative short enough exposure; for, as a rule, *a dark sky* is seldom wanted, only a slight indication of sky being required; but in case one wants to do a subject where sky has to be as heavy as the subject (say a rough storm or evening effect), then he can only do so by trials of exposure till he is well up in enlarging.

I can only, in conclusion, say that any who read this article who have not tried enlarging on bromide, the sooner they try the better, as I am sure they will never regret it, as it is one of the greatest pleasures of photography, and one is able to reproduce results not to be obtained in any other way.

I speak strongly, but I have had many years' experience in enlarging, and, so, speak with authority; and I have always felt that this branch of photography has been sadly neglected by amateurs.

The question of obtaining various colors on bromide papers by toning, I must leave for another article, or to some one else, as I have not time or space to enter on it in this paper.

◎ ◎ ◎ ◎

SUNDOWN. LESLIE SELBY.

PICTORIAL TELEGRAPHY.

SOME time ago we gave some particulars of a method of automatically transmitting photographs over a telegraph wire, reproducing them at the further end. The specimens then given were very crude, but, as we said at the time, showed very great promise. We are now able to announce that the matter has been greatly improved by Mr. N. M. Amstutz, of Cleveland, O., and is in fact almost as perfect as could be hoped for. The cuts and the text following we reprint from that excellent magazine "*Electricity*." In this Mr. Nelson W. Perry, E. M., describes Mr. Amstutz's method as brought up to date. He says:

Alexander Graham Bell found that by varying the strength of an electric current in consonance with sound waves he could transmit articulate speech nearly to the ends of the earth.

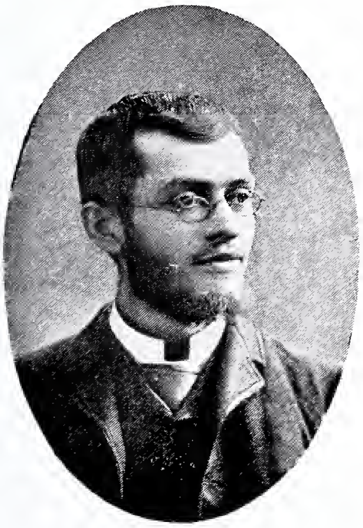


FIG. 1.

Edison, Taintor and Bell found that by causing a stylus attached to the centre of a diaphragm to which words were spoken to bear lightly upon a revolving wax cylinder they could engrave upon that wax and preserve for all time the characteristics of those words—the undulatory graved line in the soft matrix became the mechanical fac simile of articulate speech, which required merely a reversal of the process to reproduce the original sound waves. If the diaphragm stylus were allowed to trip over the undulatory graved line it would give out spoken words. If it were caused to vary the strength of an electric current those undulations might be reproduced in sound at a distant point in a telephone receiver, or, by causing this current to actuate an electro-magnetic device, a duplicate engraved record could be made in wax at the distant point which could be made to utter again the original words.

The phonograph inscription is the mechanical record of sounds. Can we make a mechanical record of light in all its various gradations? Certainly, and quite as simply.

Many substances undergo changes of solubility which are proportional to the intensity of the light to which they are exposed. One such substance is ordinary gelatine in which is dissolved a little bichromate of potassium. This, when exposed to the action of light, becomes insoluble in warm water, whereas before such exposure it will be dissolved away. If, therefore, we expose such a plate beneath a photographic negative, those portions which are exposed to the strong light will become totally insoluble; those that are entirely shielded will remain soluble; and those affected by the subdued light—the half tones—will have their solubility affected in proportion to the amount of light received. It remains now only to sponge the plate with warm water to have a photograph in relief wherein the high-lights will have the greatest elevations and the shadows will be depressed.

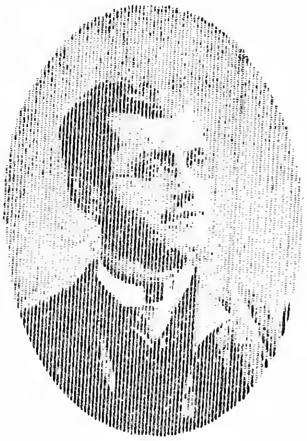


FIG. 2.

If now this relief photograph were rolled upon a phonograph cylinder and placed upon the machine, its stylus describing a fine spiral path would rise and fall as the picture passed beneath it just as it does when following the phonogram. It is not sound, however, that is wanted in this case, but another record at a distance; so Mr. Amstutz causes this rising and falling of the stylus as it passes over the relief photograph to vary in similar manner the strength of an electric current. This undulatory current passing over an ordinary telephone or telegraph wire actuates a similar stylus at the further end, which, bearing upon a revolving wax cylinder, engraves in the wax an exact reproduction in elevation of the path over which the first stylus has passed. From this cylinder an electrotype may be taken, flattened out and placed upon the press, and it is from such that the illustrations herewith produced were made.

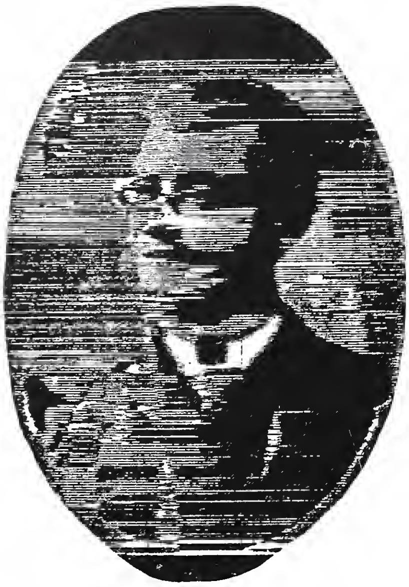


FIG. 3.

The graving tool is made V-shaped, so that as it cuts deeper it cuts wider, and in printing produces blacker lines.

If we follow the process we see that the relief photo in gelatine printed from a negative is a positive. This may be reproduced at the distant point either as a positive or as a negative. Both forms of reproduction are shown to better illustrate the process.

Fig. 1 is a reproduction from a photograph by the ordinary half-tone process of a portrait of the inventor of the artotype, Mr. N. S. Amstutz. Fig. 2 is a reproduction from the same negative made by Mr. Amstutz last summer by the artotype process. To better illustrate the progress of the art since the first description, we give Fig. 3, which is a reproduction of a portrait of the same gentleman made in 1891 and printed in our issue for November of that year The principles involved in both are the same, but the mechanical execution is far more perfect in the later than in the earlier work.

Through the kindness of Mr. Amstutz we are also able to give another series of cuts, illustrating the art, which are exceedingly interesting:

Fig. 4 is a half-tone reproduction prepared by ourselves of little Lord Fauntleroy and his dog. From the *same original* were produced Figs. 5 and 6—these by the electro-artograph. Fig. 5 is a negative reproduction such as before referred to. In this the marks of the graving tool give prominence and everything is reversed

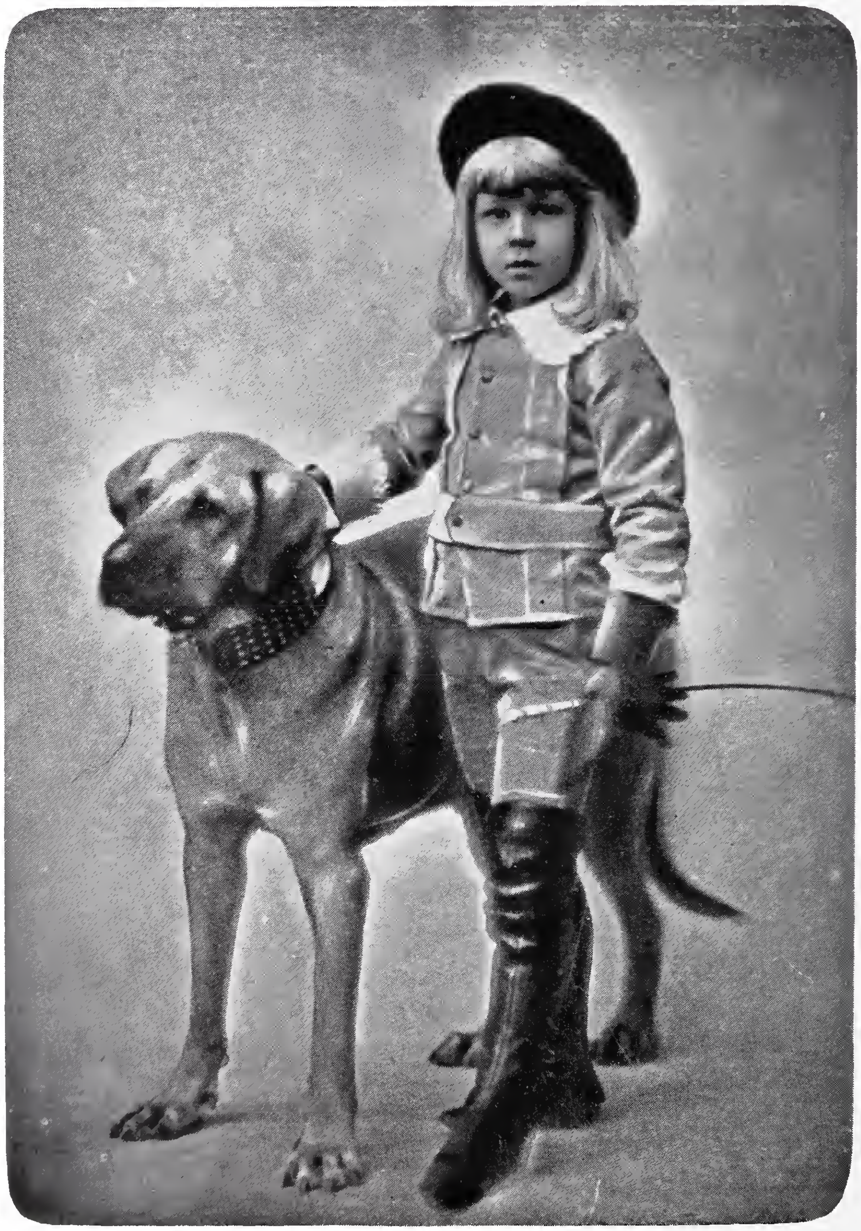


FIG. 4.

—viz., the portions of the lines which, in the positive, print black here print light, and vice versa. If this were printed in white ink on a black background the lights and shadows would come out in their proper relations. The ordinary ferrotype pictures are reproductions of a similar kind, and the writer possesses a picture from this same cut printed in silver on a black card. The effect is superb and resembles a photograph on white satin. Fig. 6 is a positive from the same original and shows the finished results obtainable after telegraphic transmission over a single wire.

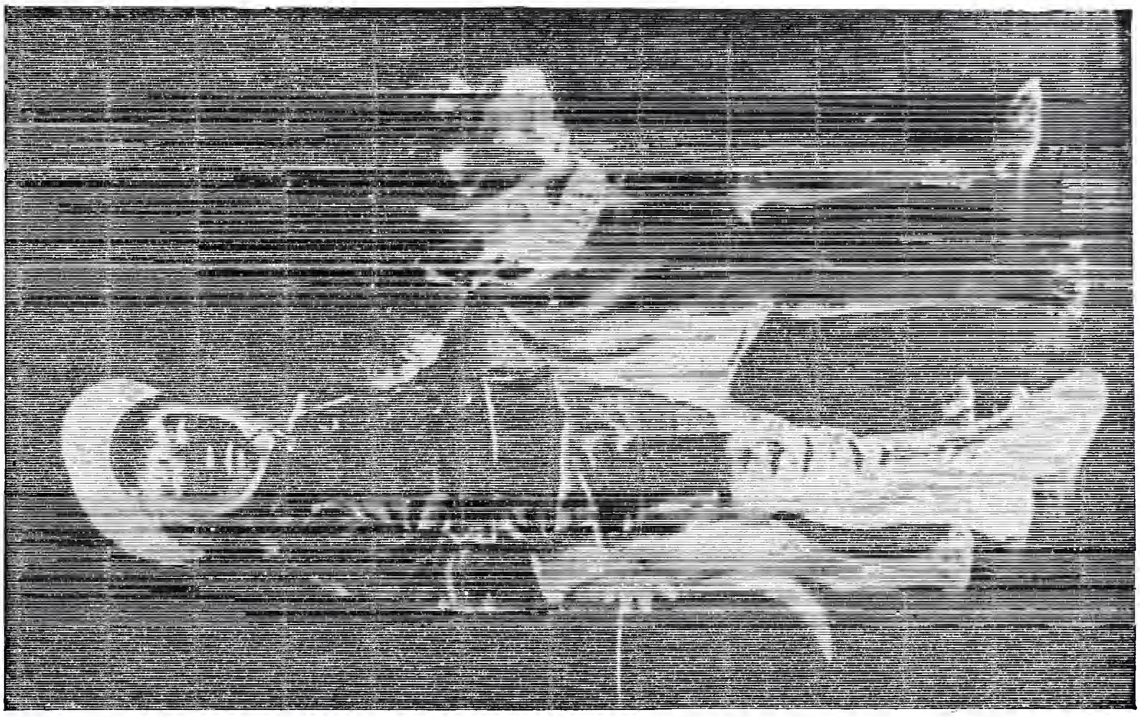


FIG. 5.

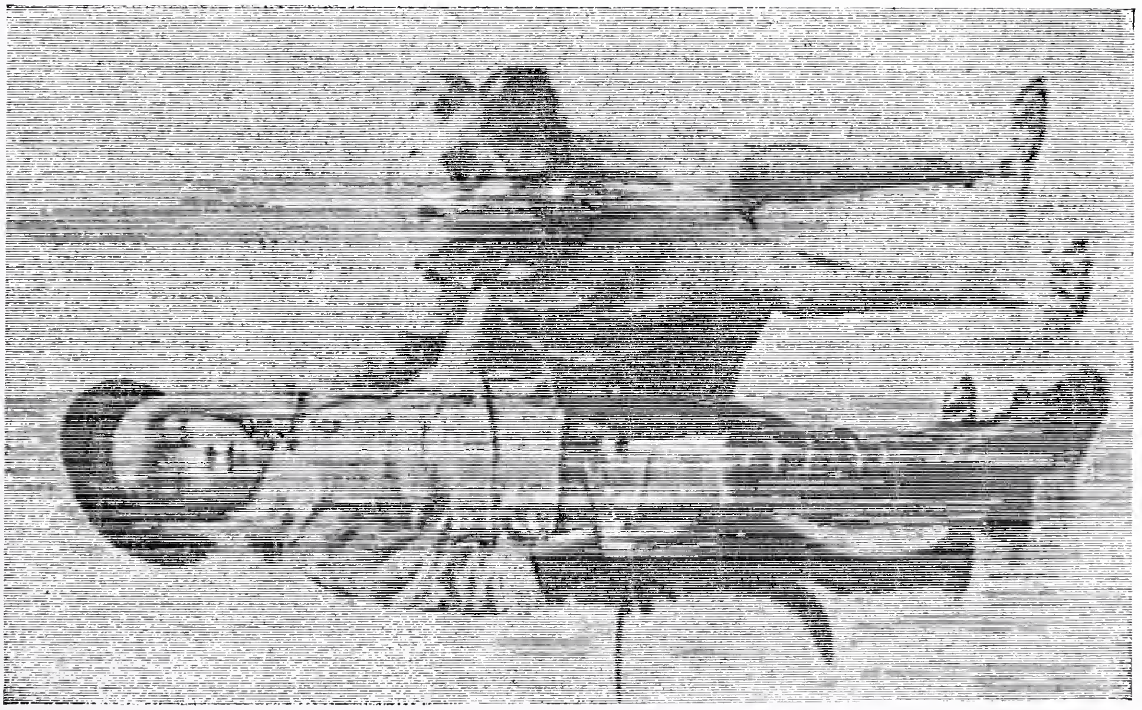


FIG. 6.

These last two reproductions are made from engravings having 80 lines to the inch. The half-tone from the original (Fig. 4) is made with 120 lines, and shows finer gradations of light; but these effects are entirely within the compass of the electro-artograph, as it has recently been constructed, to produce the same fineness of lining, and the writer received too late for reproduction in this article a sample of such work which is beautiful in the extreme.

For ordinary newspaper reproductions, however, this extremely fine work of 120 lines to the inch is not desirable, since the delicate effects are all lost in hasty presswork and poor paper.

But the great utility of this process lies in the fact that it is almost entirely automatic. The relief photo must, of course, be prepared and wound on the cylinder by hand, and the machines at both ends of the line started up, but the tracing of the transmitting stylus and the engraving on the receiving cylinder proceed without further attention.

As to the time occupied in this operation, Fig. 3 was transmitted and engraved in 10 minutes, while Figs. 5 and 6 occupied only 3 minutes' time.

In conclusion I will say that Figs. 5 and 6 were made from electrotypes from an original engraving marked "F," deposited with the Smithsonian Institution at Washington, D. C.

* * *

From "The Photogram." Photograph by Hall Edwards.

THE MYSTERY OF LIFE.

EMULSION PHOTOGRAPHY.

BY JAMES STEBBINS, JR., PH.D.

AT the request of the Editor of this Magazine, I have prepared the following notes upon the dry-plate emulsion photography from a lecture I delivered recently upon the subject before the Chemical Society of New York:

The first mention of gelatine as a vehicle for the salts of silver in the preparation of negatives was made by Poitevin in 1850. In a memoir presented to the Paris Academy, he described a process which consisted in sensitizing a mixture of gelatine and iodide of potassium in a bath of nitrate of silver. In 1851 he described an improvement upon this process, which, by the use of gallic acid, he was enabled to produce portraits in from 1 to 1½ minutes' exposure; Hawdow, in 1854, described before the Photographic Society a similar process, but used ferrous sulphate as a developer, in lieu of gallic acid.

Gandin, in 1861, was the first to describe the preparation of a true gelatine emulsion. His experiments consisted in the preparation of gelatino-iodide emulsions with excess of silver nitrate, which he developed after exposure, with either tannin, or a mixture of tannic and gallic acids.

On September 8, 1871, R. L. Maddox described, in the *British Journal of Photography*, a process for the preparation of a new gelatino-bromide emulsion, and, at the same time, exhibited several negatives made therefrom.

On November 24, 1873, King published in the *British Journal of Photography*, Vol. 20, p. 542, a more detailed account of the manner of preparing gelatine emulsions, and, among other things, described the process of removing the soluble salts by washing.

On page 544 of the same journal, Johnston recommends the use of an excess of soluble bromide, which hint was recognized to be of considerable value, and was subsequently adopted in the preparation of gelatine emulsions.

Burgess, in July, 1873, was the first to introduce gelatine emulsions to the trade; but his formula for the preparation of the same was kept secret. He deserves, however, the credit of being the first to put upon the market a product of uniform and reliable quality.

Kennet, in 1874, described in the *British Journal of Photography* a process for the preparation of washed gelatine emulsions, which he introduced to the trade in the shape of dry sheets.

Wratten & Wainwright described, in "The Year Book of Photography" for 1878, a method of pressing gelatine emulsions, through a coarse meshed fabric contained in a vessel of water, for the purpose of better enabling them to wash out the soluble salts.

The emulsions produced up to this time were, however, not very sensitive to light; in fact not as much so as an ordinary wet plate, but, on the 29th of March, 1878, Bennett made a big advance in the right direction, by discovering that on submitting the emulsions to a prolonged digestion at a temperature of 32 deg. C., their sensitiveness was enormously increased.

In 1879 Van Monckhoven took up the study of this question, and discovered that the increased sensitiveness of gelatino-bromide emulsions, upon prolonged digestion, is associated also with a molecular change. He also made the additional discovery that the conversion of bromide of silver into the sensitive green modification is materially enhanced by the presence of ammonia, and from which observation he was enabled to work out a "cold process" for the ripening of emulsions.

Schumann, in 1882, from numerous spectroscopic observations, discovered that a mixture of bromide and iodide of silver gave better results and more sensitive emulsions than bromide of silver alone.

The preparation of orthochromatic plates depends upon an observation of Prof. Vogel in 1873, who discovered that certain coloring matters act as optical sensitizers.

The first gelatine plates of this kind were stained with eosine, and were manufactured by Attout & Clayton.

In 1884, Schumann & Vogel introduced to the German trade their color-sensitive "Azaline" plates. Eder in the same year recommends the use of erythrosine, as a sensitizer for the yellow and green rays of the spectrum.

The foregoing brief historical review having prepared you in a measure for what is to follow, we will now consider the haloids, or light-sensitive salts of silver.

The haloids employed in the manufacture of gelatine emulsions are three, viz.: Chloride of silver, AgCl; bromide of silver, AgBr; and iodide of silver, AgI. They are each produced by the action of silver nitrate upon a soluble bromide, chloride or iodide, or the corresponding acids, thus:

Silver nitrate.		Sodium chloride.		Sodium nitrate.		Silver chloride.
$AgNO_3$	+	NaCl	=	$NaNO_3$	+	AgCl.
		Potassium bromide.		Potassium nitrate.		Silver bromide.
$AgNO_3$	+	KBr	=	KNO_3	+	AgBr.
		Potassium iodide.		Potassium iodide.		Silver iodide.
$AgNO_3$	+	KI	=	KI	+	AgI.

Bromide of silver, the most important of the three haloids, exists in six modifications, viz.:

1. The white flocculent modification.
2. The yellow flocculent modification.
3. The intensely yellow powdery modification.
4. The white powdery modification.
5. The yellowish white granular form.
6. The crystalline modification.

1.—FLOCCULENT BROMIDE OF SILVER.

If silver nitrate is mixed in the cold with a dilute solution containing 0.5 per cent.—1 per cent. of a soluble bromide, or hydrobromic acid, a cheesy precipitate of bromide of silver will be formed. The latter will be perfectly white if an excess of the silver salt is used; but will be of a deep yellow color if an excess of the soluble bromide is used.

The white or yellow flocks thus formed rapidly break up or become disintegrated upon shaking, if the solution is neutral, but more slowly in an acid solution.

This white or yellow precipitate, especially the latter, if allowed to rest undisturbed for some time, will gradually cake together, being eventually converted into a plastic mass of a pale to light yellow color, according to the original color of the precipitate.

If this product be now exposed to the air, it will gradually shrink up, and be converted into a hard, opaque mass.

Both the white and yellow flocculent silver bromide blacken rapidly when exposed even to diffused daylight. The plastic form also blackens, but after it has once hardened, it only turns greenish on exposure to diffused daylight.

2.—POWDERY BROMIDE OF SILVER.

The flocculent modification is rapidly converted into the powdery modification, by shaking it up with water in a neutral solution. It is thus obtained in a very fine state of division, and its color is changed to a yellowish-white shade. If allowed to dry in the air, out of contact with the light, it will be obtained in the shape of a yellowish-white powder. If the latter is heated, it hardens and assumes an intense yellow color.

While moist, it is not so readily affected by light as the flocculent silver bromide; but, if dried at ordinary temperatures it is even more sensitive to light than the powdery chloride of silver.

3. GRANULAR BROMIDE OF SILVER.

This product may be obtained by mixing either the flocculent or powdery modification with cold water and pouring the mixture into boiling water. It will thus instantly be converted into a fine dust of remarkable softness. It may be produced directly by adding to a boiling solution of silver nitrate 1 : 1,000, a very dilute solution ammonium bromide.

The granular product obtained from flocculent bromide of silver is of a dull yellowish-white color, whereas that obtained from the powdery modification is of a brilliant yellowish-white color.

By boiling this product for several days with water, it will gradually become suspended in this medium, in such a fine state of sub-division as to make it appear milky. In this condition it will only settle after a very long rest. The sediment thus obtained will be of a pearl-white color, which, if brought into contact with ammonium bromide, immediately assumes an intense yellow color.

These three compounds, viz., the dull yellow, the brilliant yellow and the pearl-white granular silver bromide, are, according to Stas, the most sensitive of all the silver bromides to light.

CRYSTALLINE SILVER BROMIDE.

Freshly precipitated silver bromide is soluble in ammonium hydrate solution of 0.88 specific gravity. On adding water to a saturated ammonial solution of silver bromide, the latter compound is precipitated in a crystalline form. Thus by diluting the ammonial solution with 5 parts of water, it will be obtained in microscopical transparent crystals of the most varied forms and colors. These crystals are not affected by the strongest sunlight.

On the other hand, if the ammonical solution be diluted with only 1 part of water, bromide of silver of a different crystalline form will be precipitated.

These latter crystals are transparent to transmitted light, but, like the former, they reflect all the hues of the rainbow. They are easily decomposed by heat, or by contact with water or acid, and are thereby converted into yellow bromide of silver, which readily darkens on exposure to light.

Silver Chloride.

This compound, like the preceding one, exists in several modifications. It differs from silver bromide, however, in being more soluble in water and ammonium hydrate, and also in being much less sensitive to light.

Iodide of Silver.

This compound exists in two forms, viz.: the crystalline and amorphorus. When precipitated with an excess of potassium iodide, it is of little sensitiveness to light, but, if precipitated in the presence of an excess of silver nitrate, it is much more sensitive.

At its best, however, it is not comparable in sensitiveness to silver bromide.

Therefore, in the manufacture of the fastest emulsions, bromide of silver will be either used alone or in conjunction with a small quantity of iodide of silver; whereas, silver chloride is only used in the manufacture of very slow emulsions, such as are intended for lantern slide plates and transparency plates.

Gelatine.

As gelatine plays a very important *rôle* in the preparation of emulsion, it must be selected with the utmost care, and only such gelatines as are capable of withstanding a prolonged boiling with bromide of silver, or a prolonged digestion with ammonia, without producing fog, should be used.

There are two kinds of gelatine which seem to answer the requirements of emulsion makers, viz.: Nelson's soft gelatine and the German hard gelatine.

The latter, though possessing many advantages, especially in warm climates, where the tendency to frill is great, has nevertheless its drawbacks, as it has a tendency to produce fog. The soft, or Nelson gelatine, though free from this defect, is, on the other hand, too soft to admit of proper handling in warm weather.

It is therefore customary in the manufacture of emulsions to combine the two in such proportions that the defects of one may be neutralized by the good qualities of the other. The proportion in which to combine the two kinds of gelatine will depend entirely upon the manner in which the emulsion is made, and upon the use to which it is to be put.

Thus, an emulsion made by the cold digestion, or ammonia process, will require the admixture of more hard gelatine than one made by the hot process. Again, an emulsion, intended for use in hot climates, will require more hard gelatine than one intended for use in temperate climates. These are points which the practical emulsion maker fully understands and knows how to adjust to suit the requirements.

Formation of Gelatine Emulsions.

Gelatine emulsions, as already stated, are mixtures, containing one or more of the light sensitive or haloid salts of silver, suspended in an exceedingly fine state of subdivision in gelatine. They are prepared by adding nitrate of silver to an aqueous solution of gelatine and some soluble bromide, iodide or chloride, or mixtures of the three and shaking the mixture until thorough emulsification has ensued.

In performing this operation, however, certain rules established by practice must be adhered to. Thus care should be taken that the relation of the quantity of soluble bromide to the nitrate of silver should be so adjusted that there shall always be a slight excess of the former present. An excess of silver nitrate would be liable to induce decomposition of the emulsion, even in the absence of light. Dry plates prepared with such an emulsion and then submitted to development would not only be developed in the exposed portions of the plate, but would also be reduced in the unexposed parts, thus producing a totally black plate instead of an image.

An excess of soluble bromide, however, ensures the preparation of an emulsion of good keeping qualities, which thoroughly withstands the subsequent operation of ripening without change. Experience has shown that the proper proportions of silver nitrate and soluble bromide to employ are 5 to 11 parts of silver nitrate to 4 to 7 parts of potassium or ammonium bromides.

The Ripening of Gelatine Emulsions.

Gelatine emulsions, when freshly prepared, are endowed with only a very small degree of sensitiveness. Their sensitiveness to light can, however, be greatly increased by submitting them to an additional treatment.

This treatment is what is known in the trade as the ripening process.

The ripening of emulsions may be accomplished in three ways, viz.:

1. By the ammoniacal oxide of silver method, which is easy of application and gives good results in the hands of some persons.

2. By the hot digestion process, which, though a little more troublesome of application than the former, is nevertheless very extensively used.

3. By the cold digestion process.

Each of these processes has its advocates, and it is really difficult to form an opinion as to which of the three gives the most satisfactory results, as each manufacturer will claim that his particular formula will turn out the best emulsion.

During the process of ripening the bromide of silver (and this applies equally as well to the two other haloids), which is suspended in the gelatine and which at first is of a powdery consistency, gradually increases in volume, and assumes more of a granular consistency, and at the same time becomes slightly soluble in water, and changes its color from yellowish-red at the start to violet or bluish-gray at the finish. This change of color can be easily followed by the eye and is an indication in the hands of experts of the progressive ripening of the emulsion.

The duration of the digestion, as well as the proper temperature to be used, should not depart from certain fixed limits, as otherwise a partial reduction of the haloids may take place.

The digestion of the emulsion is continued until the original color of the haloid is changed to the before mentioned bluish-violet or bluish-gray shade.

To properly follow this change of color a drop of the emulsion is from time to time placed upon a plate of glass and examined while still fluid by transmitted light. When the desired color has been reached, the digestion is discontinued.

The Preparation of Gelatine Emulsions.

On a small scale, the preparation of gelatine emulsions may be briefly described as follows:

To a warm aqueous solution of gelatine, containing the required quantity of soluble bromide, chloride or iodide, add little by little the required quantity of an aqueous solution of nitrate of silver. After each addition of silver nitrate, shake the mixture up violently, in order to ensure a thorough emulsification of the haloids.

The emulsion, by whatever formula it is prepared, is then ripened, by either boiling it for about half an hour, or, after adding ammonia, digesting it for 30–45 minutes at a temperature of 45 deg. C.; or, lastly, the quantity of gelatine is decreased, so that an emulsion of more fluid consistency at ordinary temperature, is obtained Then adding ammonia, and allowing it to digest at room temperature for ten hours. This latter process is called the cold digestion process.

These three processes are, according to the nature and sensitiveness of the plates required, subject to modification, and, frequently, all three are combined.

As the gelatine emulsions are exceedingly sensitive to white light, especially so when completely ripened, the greatest care should be observed to exclude it during their preparation. A dull red light, to which the emulsions are not so sensitive, may be used. Lanterns particularly constructed for supplying a light of this kind are to be found in every well equipped dark-room. Moreover, the vessels in which the digestion or ripening of emulsions is carried on should be supplied with tightly-fitting covers, in order to exclude both light and the products of combustion of the gas or alcohol employed to heat the water baths. A simple form of apparatus of this kind may be seen in the following illustration.

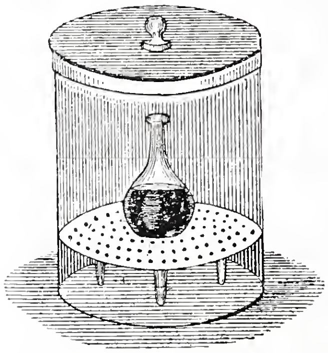


FIG. 1.—APPARATUS FOR DIGESTING EMULSION.

It consists of a cylindrical tin vessel, supplied with a tightly-fitting cover, and also with a perforated disk at the bottom, to serve as a support for the emulsion bottle. This disk is slightly raised from the bottom of the vessel, in order to prevent the emulsion bottle from becoming over-heated.

The emulsion bottle is now placed in the digester, and the latter is filled with water up to the neck of the bottle. The digester is now covered over and then placed upon either a gas stove or heated with an alcohol lamp.

A thermometer is now inserted into the digester, and the digestion started by lighting the gas or alcohol lamp.

After the emulsion has been thoroughly ripened, it is submitted to a washing operation for the purpose of eliminating the excess of soluble bromide, iodide or chloride, together with such other salts as are formed by the interaction of the silver nitrate upon the soluble bromide, etc.

Thus, for instance, when silver nitrate is allowed to react upon potassium bromide, potassium nitrate and silver bromide are simultaneously formed, according to the following equation:

$$Ag\,NO_3 + K\,Br. = K\,NO_3 + Ag\,Br.$$

As the above reaction takes place in the presence of gelatine, both the potassium nitrate and silver bromide will be found in the final product.

If both the excess of bromide and potassium nitrate, etc., were allowed to remain in the emulsion, they would eventually alter the sensitiveness of the dry plates made therefrom and would, moreover, cause trouble by crystallizing out while the emulsion was being fashioned into dry plates, and in all likelihood spoil the latter.

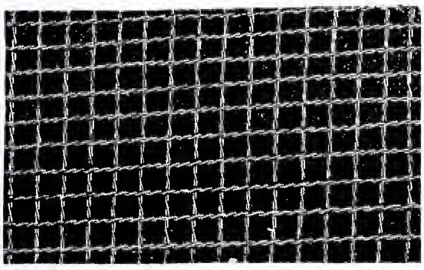


FIG. 2.—SIEVE FOR BREAKING UP EMULSIONS.

It will, therefore, readily be seen, the necessity of removing these saline products by washing.

To accomplish this, the emulsion, while still hot, is poured into a flat porcelain or glass dish, and placed in a cool room until it has set. In summer time, it may even be necessary to place it in a refrigerator.

Once set, the emulsion is broken up into small pieces, or, better still, is forced through a hair sieve, of about 2–4 m.m. meshes, into a vessel of cold water, stirred around and allowed to settle. The water is then poured off and the vessel refilled with fresh water. This operation is repeated five or six times, or until all soluble saline matter has been removed.

Various contrivances have been devised for accomplishing this result. Fig. 3 is an illustration of a washing apparatus.

After the emulsion has been thoroughly washed, it is spread out upon a piece of clean linen, supported by a wooden frame, then rolled and finally twisted up by turning the two ends of the linen in opposite directions (Fig. 4), until all the superfluous water has been squeezed out.

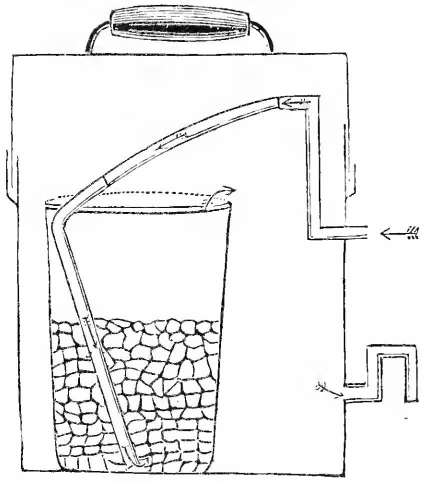


FIG. 3.—EMULSION WASHING APPARATUS.

On a large scale the expulsion of the superfluous water is effected by centrifugal action in specially constructed apparatus.

The water having been expelled, the emulsion is now ready for filtration.

To accomplish this, it is melted on a water bath at a temperature not exceeding 50–60 degs. C., and then filtered through filter paper or chamois skin, in an ordinary funnel, but owing to the viscosity of the emulsion, filtration by this means is very slow. To obviate this, filtration on a large scale is now performed under pressure, as may be seen from the accompanying illustration (Fig. 5).

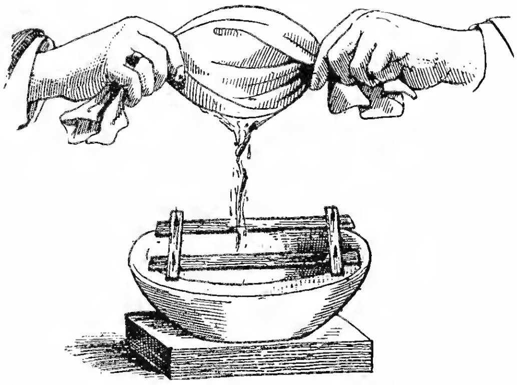


FIG. 4.—DRAINING EMULSION.

This diagram will explain itself, but it must here be stated that the filtering membrane is a piece of chamois skin.

The emulsion having now been filtered, is ready for the manufacture of dry plates

If, however, it is not desired to coat the plates at once, the emulsion may be dried and kept in the dark for future use.

This is best accomplished by soaking the emulsion in strong alcohol, which, in a comparatively short time, will abstract the water, leaving the emulsion in a completely dehydratde condition. The alcohol is then poured off and the emulsion spread out, to allow the small quantity of alcohol still adhering to it to evaporate spontaneously, when it should be bottled to preserve it against dust and humidity

DRY PLATES.

It will now be asked, what are dry plates? This can probably best be answered by stating that dry plates consist of a thin film or coating of gelatine emulsion, spread out evenly over any convenient transparent or translucent support.

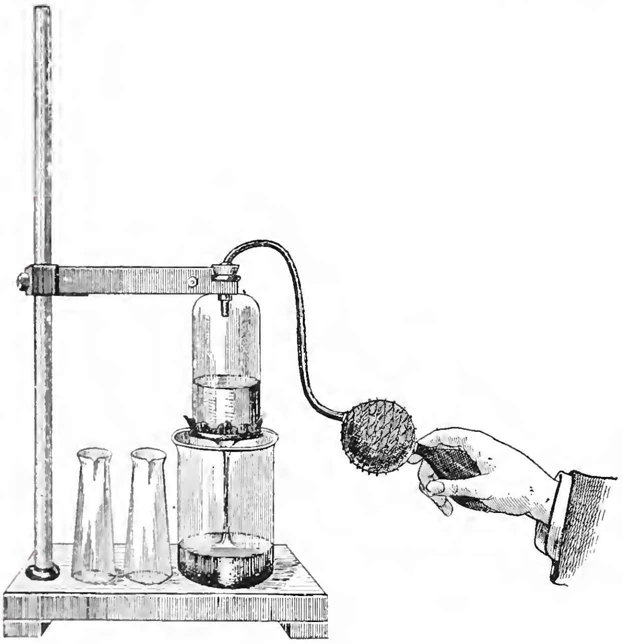


FIG. 5.—FILTERING APPARATUS.

Several supports of this kind have been recommended, among which glass, however, is the most extensively used. As examples, of other supports, I would mention paper and thin sheets of collodion or celluloid and gelatine.

We will, however, first consider the coating of glass plates on a small scale.

A glass free from flaws having been selected, it is next scrupulously cleaned, by polishing it with precipitated chalk and alcohol. It is then placed upon a leveling table (Fig. 6) and accurately leveled up. This having been attended to, the plate is next grasped by the lower left hand corner (Fig. 7), and the measured quantity of emulsion poured upon it, starting at the upper right hand corner. By then making the plate describe a circular motion, the emulsion is caused to flow evenly over the whole extent of the glass. It should here be stated that, before attempting to coat the plate, the latter should first be slightly warmed in order to prevent a sudden chilling and congealing of the emulsion.

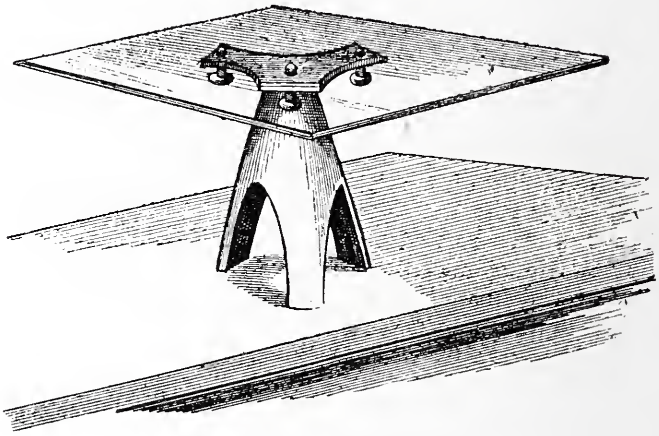


FIG. 6.—LEVELLING STAND.

The plate is now again placed upon the leveling table, and allowed to remain there, until the emulsion has thoroughly set, when it is again removed and stood upon end to dry.[*]

The process just described, though convenient for the preparation of a small number of dry plates, is, however, impracticable for the manufacture of dry plates upon a commercial scale.

In well appointed establishments, the glass plates are all coated by specially constructed machinery.

The plates to be coated are first heated by being placed upon a heating apparatus which consists of a hot water bath, 7 feet long, supported by legs, somewhat in the guise of a table. The hot water in the bath is kept in constant circulation, through a system of pipes connected with the boiler.

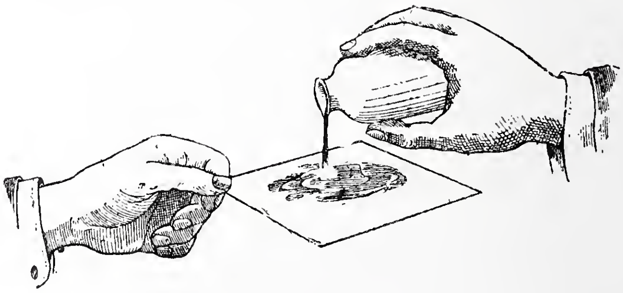


FIG. 7.—COATING THE PLATE.

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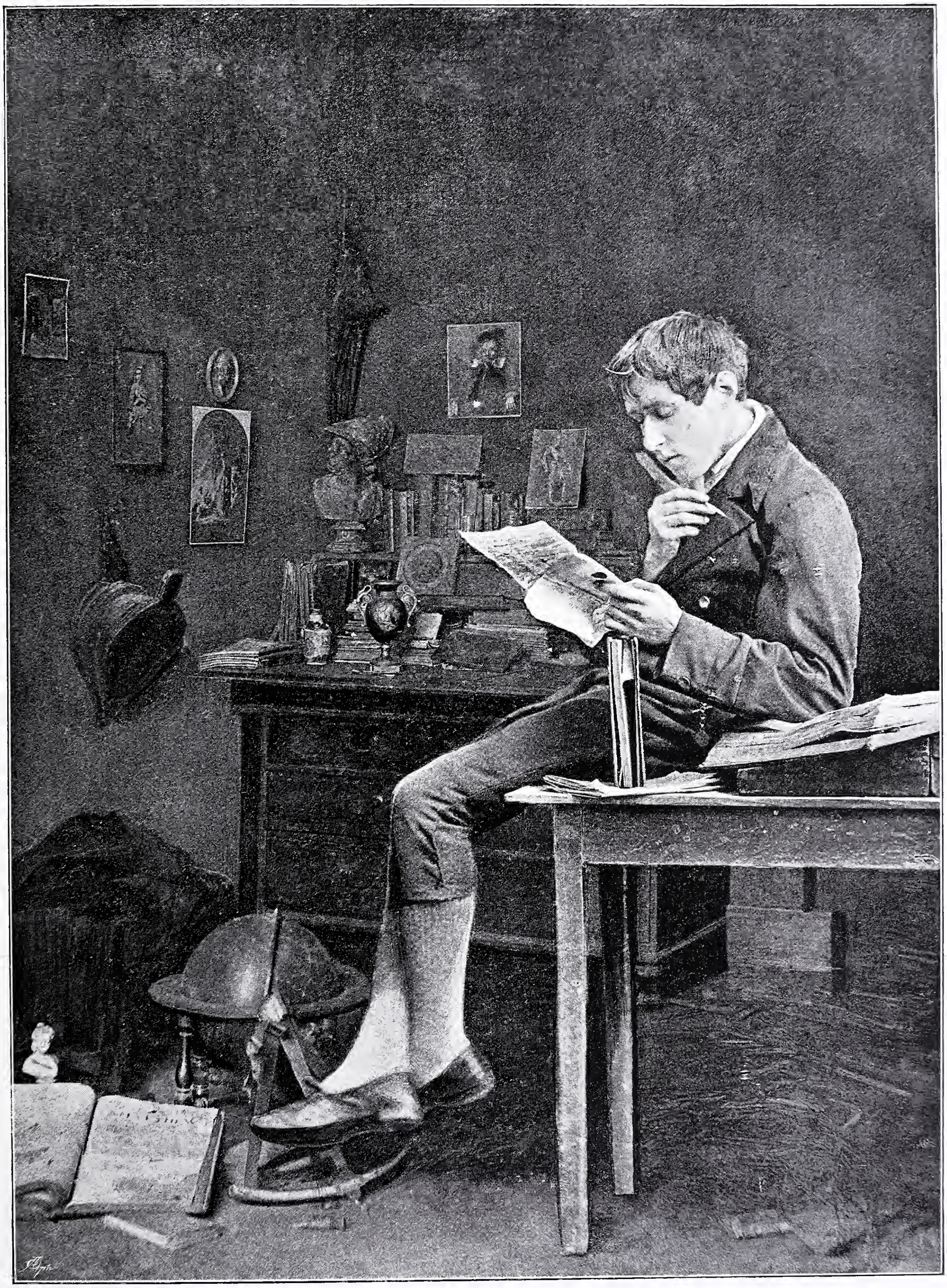
[*] In coating dry plates commercially, the glass is first washed over with a weak solution of albumen or gelatine and chrome alum as a substratum. It forms a thin film on the surface of the glass to which the gelatine emulsion adheres tenaciously, thus preventing frilling.—ED.



THE STUDENT.
BY ADAM DISTON.

One end of the apparatus abuts up against the dark-room, in which the plate-coating machinery is located. An attendant stands at the other end and feeds the plates into the tray as fast as they are needed by the operator in the dark-room. While the plates are traveling from one end of the table to the other, they are covered over by a movable cover, shown to the right in the diagram, in order to insure a more perfect heating, and to keep out dust. The dark-room, or coating-room, should also be kept at a sufficiently high temperature, in order to prevent the emulsion from chilling and permit of its flowing freely from the coating machine. The room is heated by a system of steam radiators.

The plates having reached the dark-room, are now ready for coating For this purpose they are placed upon the endless belts of a coating machine, which automatically feeds them under the emulsion-spreading device and eventually emerge therefrom, at the other end of the machine fully coated.

Fig. 8 will illustrate the construction of one of these machines. The emulsion in the trough *A* is pumped into the smaller trough *E*, which overflows on to the plates running along one after the other on the rollers *M M*. *P* is a roller running in hot water, which cleans the backs free from any emulsion and pushes the plate on to the slab indicated on the left hand of the drawing; here the plates separate and run along on bands upon a sheet of slate over which a thin film of ice cold water is flowing. By the time they reach the other end they are properly set and can be removed to the drying rooms.

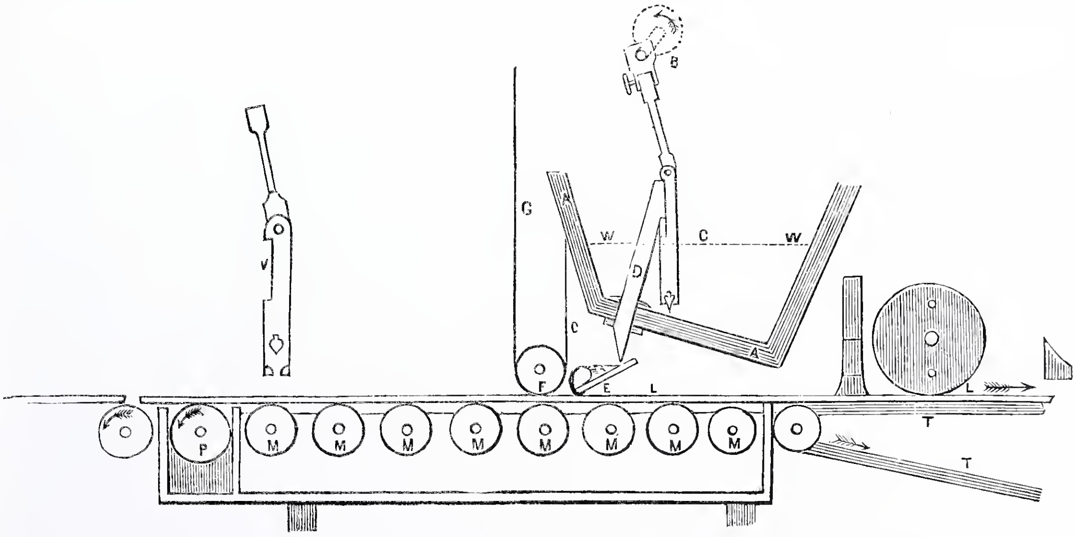


FIG. 8.—CADETT'S COATING MACHINE.

For this purpose they are usually stood upon end in wooden or metallic racks (Fig. 9), dried in a drying box, or are transported to a drying room and stored away in wooden frames till perfectly dry. The temperature of the drying room is maintained at 18–20 degs. C., at which temperature the plates will usually dry in 8–16 hours, according to the thickness of the emulsion and the dryness of the atmosphere.

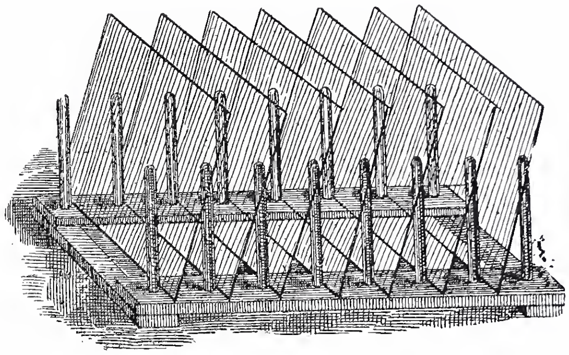


FIG. 9.—PLATE RACK FOR DRYING.

The plates having now been thoroughly dried, are cut up into the regulation sizes and packed away in light tight boxes.

Orthochromatic Plates.

Although bromide of silver is very sensitive to the blue and violet rays of the solar spectrum, yet, to the yellow, green and red rays, it is of very much less sensitiveness.

Now, H. W. Vogel, in 1873, discovered that the sensitiveness of the silver haloids to these colors may be very greatly increased by the addition of certain dye stuffs or coloring matters which are themselves capable of absorbing these rays. Dry plates of this kind are called orthochromatic, or isochromatic, *i.e.* color-sensitive plates. By the use of orthochromatic plates, colored pictures are reproduced in their proper light-values; thus yellow will appear in the photograph lighter than dark blue, whereas in ordinary photographs just the contrary effect would be obtained.

Orthochromatic plates, as may be seen, are of great value for the reproduction of paintings, old documents, and in landscape photography, especially where much green and yellow foliage prevails. They are of value also in taking distant views of mountains, which, owing to their bluish appearance, are difficult to distinguish from the sky.

The coloring matters usually employed for rendering the plates color sensitive are erythrosine, eosine and chinoline red, for the yellow and green rays of the solar spectrum ; or cyanine for the red rays of the spectrum.

By mixing these colors together, plates may be produced which are sensitive to the yellow, green and red.

Orthochromatic plates are prepared in two ways :

1. By bathing the plates in the proper color mixture and allowing them to dry.

2. By incorporating the color mixture with the emulsion while the latter is in process of manufacture.

On a small scale, and for those who only have occasional use for orthochromatic plates, the first method will be found the easiest of application. Although the results obtained by this method are excellent, yet the process labors under one serious disadvantage, namely, the poor keeping quality of the plates, for at their best they will not last longer than two or three days.

Therefore, where a plate of good keeping quality is required, recourse must be had to the second process.

Orthochromatic plates on a large scale are all made by the second process, and although their keeping qualities is not as good as that of the common dry plates, yet I have known them to last for six to eight weeks without any marked deterioration.

Eosine and erythrosine are either used as such in aqueous solution for staining the plates, or where greater speed is required, as eoside or erythroside of silver in ammonial solution. The latter product may be obtained by adding nitrate of silver to an aqueous solution of eosine or erythrosine, collecting the precipitate of eoside or erythroside of silver upon a filter, washing with distilled water and then dissolving it in dilute aqua ammonia.

As both the eoside and erythroside of silver are light-sensitive, they must be prepared in the presence of a dark-red light only.

In this country the only brands of orthochromatic plates upon the market are the Cramer isochromatic plates, and the Carbutt and the Eagle orthochromatic plates.

In conclusion I would call your attention to another class of plates which, within the last two or three years, has received more or less attention at the hands of photographers. I refer to the so-called "non-halation plates."

Probably all persons who have dabbled in photography will have noticed that when an attempt is made to take the picture of a poorly lighted interior, against a strong light, that in eight times out of ten the windows and all objects in their immediate neighborhood will be so terribly over-exposed as compared with the rest of the picture that the negative will be perfectly valueless as a printer, as all detail in the high-lights will be completely obliterated.

This phenomenon is termed "halation," and many devices have been proposed for its correction. It is caused by the reflection of light from the glass of the dry plates, after the latter has penetrated and traversed the film of emulsion.

One of the oldest devices for this purpose consisted in pasting a piece of black mat surface paper against the back of the plates. This, in a measure, remedied the trouble, but by no means eradicated it. Another device, and an improvement upon the first one, consisted in backing the plates with a mixture of lamp black and oil, or shellac.

Though this process gave fairly good results, yet the process of backing the plate was troublesome and dirty and one fraught with more or less danger in the subsequent handling of the plates.

Another party sought to prevent halation by backing the plates with an oil mixture, possessing the same index of refraction as glass, but he did not state what means he took to prevent the oil from rubbing off when the plates were placed in the plate-holders.

About three years ago, Thomas & Co., a firm of English plate manufacturers, conceived the brilliant idea of coating their plates with two layers of emulsion of different speeds and reasoned thus :

If halation is caused by the reflection of light from the glass plate, then by interposing a mat film of slow emulsion between the glass and the layer of fast emulsion, the refraction of light must be decreased in proportion to the oapacity of the interposing film of emulsion and accompanied by a corresponding diminution in the degree of halation.

This reasoning has been fully substantiated by experience, as the negatives taken upon these doubly coated plates show a marked improvement over those taken upon the single coated plate.

Double coating serves also another purpose, namely, the correction of over-exposed plates; for it can readily be seen that if it takes, we will say, five seconds to make a normal exposure upon a fast single coated plate and the operator should give the plate an exposure of twenty seconds, then the probabilities are that the plate would be so horribly over-exposed as to be utterly valueless.

But if we substitute a doubly coated plate for the former and give it an exposure of twenty seconds, other things being equal, we shall in all probability obtain a fairly good negative; why, because the exposure of twenty seconds, which is just three times too much for the fast emulsion of the singly coated plate, will be just about the proper exposure for the slow emulsion which underlies the fast one in the doubly coated plates.

For the beginner, therefore, who, as a rule, has but a very vague conception of time exposure, these plates should prove a boon.

The plates just alluded to were called the "Sandell" plates, and met with such success that manufacturers in this country were not slow to avail themselves of their English cousins' experience; for it was only a short time after this that the firms of Seed & Co., and Wuestner & Co., almost simultaneously introduced their doubly coated plates to the trade.

These gentlemen were shortly afterward followed by John Carbutt, who also introduced a new non-halation plate, which he termed "Columbian Coated Eclipse" plates.

These plates are a radical departure from those just described, and embody the old method of backing in a novel and modified form. They are prepared by coating the backs of the plates with a mat black, closely adhering collodion varnish.

As these plates are perfectly opaque and consequently unsuitable for developing, while still carrying their non-halation backings, it is necessary to free them from these before submitting them to development. This can very easily be effected by simply drawing the point of a knife over the varnish and then allowing a jet of water to play upon it, while the film is shoved aside with the fingers. The plate may then be manipulated in the usual manner.

FEEDING THE HENS. BY EMMA D. SEWALL.

WANTED, A SHUTTER.

BY W. J. STILLMAN.

IN one of the most interesting branches of photography, the recording of extremely rapid movements, either of animal or inorganic phenomena, the action of animals, the flowing or falling of water or movement of solid bodies, we require an apparatus more flexible and rapid, as well as more amenable to registration than any now in existence, and it is a thing which American ingenuity might well set itself to supply. I have been using the Thornton-Pickard shutter for two seasons, and though I have had some admirable results, I am convinced that its defects are such that no confidence can be placed in the accuracy of its register, or in the perfection of its work. For the smaller sizes of plates it may be satisfactory for amateurs who want simply very rapid records of races and games, but working it on a plate 8 x 10 inches, as I do, its performance is not satisfactory. As generally sent out, it works vertically and downward, so that the strength of the motive power is greatest on the foreground, and falls off as it reaches the sky, where it might well be stronger. And in this case the action is intermittent, leaving bands of greater and less intensity across the sky, which, in three cases out of four, make the negative unpresentable, even when used vertically as it is intended to be used. But when the action is horizontal, as it ought to be in the great majority of cases, as following the direction of motion, the irregularity is much greater, and it was rarely the case that I have been able to get a clean sky or distance in a negative.

The principle of the focal-plane shutter is the true one for the highest rapidity, but the mechanism thus far employed is far too primitive and refractory for delicate adjustment. The blind which passes along the plate and, by the aperture in it, makes the exposure, is loose at the released end, and flutters like a banner in the wind, carrying the edges of the aperture nearer and farther from the plate as it passes, with the double effect that, as it touches the sides of the channel in which it runs, it offers more resistance, and moves more slowly; and it opens relatively a larger angle of opening to the light, producing bands of greater or less intensity, which I find disastrous.

It is necessary that the blind should work horizontally as a rule, but there will be occasions on which it will be required to work vertically, and the action ought to be the same in either case, otherwise we cannot check the rate of motion and the time of exposure. Now the first requisite for the regularity of the tension and consequent rate of motion is, that the traction of the spring which constitutes the motive power shall be such that the change of direction from vertical to horizontal shall not affect the velocity appreciably, and that the motion in either case shall be absolutely constant. This can only be realized when the tension is so strong that the weight of the blind is immaterial, and can make no valid difference between the upward and the downward motion, and, when used horizontally, will ensure a constant motion. These conditions do not obtain in the Thornton-Pickard shutter, and out of two dozen, more or less, negatives made this summer with it at the high rates of speed, not more than three or four were free from bands of greater or less intensity.

The mechanical condition necessarily to be complied with are the following: the tension of the spring which drives the blind must be great enough to make the weight of the blind and its attachments too trivial to be taken into account, whichever direction it works in. The Thornton-Pickard shutter, so far from complying with this condition, does not drive the blind home when it is made to work upward at slow speed. The tension of the blind should be sufficient to allow a break at the end of release so that the tension shall not be thrown off on release, and the blind as a consequence should be kept taut from the beginning to the end of the exposure. This is necessary for two reasons: firstly, because the fluttering produces inequality of speed and consequent inequality of exposure, and, second, because as the slit in the blind approaches toward, or recedes from, the plate, the slit is wider in its angle, and so admits, relatively, more light to the plate when it is nearer to than when it is further from it. It may be said that these elements are too trivial to make a perceptible difference in the character of the negative, but my experience is conclusive, and I am obliged to give up the use of the Thornton-Pickard focal-plane shutter for large negatives owing to the defective action in these respects. I inclose two prints as illustrations of the defect, both taken in vertical action; those taken in horizontal were generally much worse.

It is necessary that the exposure should be capable of being carefully measured, and that the elements of calculation shall be as simple as possible. For this purpose the adjustable slit, employed by the Thornton-Pickard Company, should be abolished, the more as it adds injuriously to the weight of the blind. The coiled spring, if this be the motive power, should be long enough for its entire action to be taken in the middle of it, as with the springs of the Waltham watches, to avoid a falling off of the tension toward the end of the movement. In the case of the Thornton-Pickard shutter this is not the case, as the tension almost ceases at the end of the movement, unless the higher degrees of tension are employed, and this prevents the use of the shutter at low speeds, as the irregularity of illumination at those speeds is prohibitive of good work, at least in my own experience.

I am not going to offer an invention for some one else to carry out, and then claim the credit of having invented it, when it is made a fact, as is too often the case with speculative inventors; I only state a want, and hope that Yankee ingenuity will supply it, and profit by it. I have neither a work-shop to try experiments in or time to try them. I sum up the conditions of success as follows: a moving blind passing at a perfectly regular and regulatable rate before the sensitive plate and in close proximity to it, the closer the better; a break to maintain the tension of the blind, and if possible regulate its action and keep it in the space allowed it so that it shall not be nearer the plate at one instant than at another; a shunting arrangement, if possible, so that the blind may be wound up and the tension applied afterward, and a balanced motion which shall give no recoil to the shutter in action.

We print the above article by W. J. Stillman, as we think that his suggestion upon the theoretically perfect instantaneous shutters will be of interest to our readers So far as we know the Thornton-Pickard shutter is as near to the requirements of a theoretically perfect focal plane shutter as any one on the market — EDITOR.

ON THE COLNE. BY CARL GREGER.

SOME ERRATA IN THE "ANNUAL" FOR 1895.

BY N. B. SIZER, M.D.

I REGRET to appear always as a corrector of other people's work, but I have the welfare of our "Annual" so much at heart that I canno bear to see any serious imperfections therein.

In August, 1891, at the request of the editor I prepared a short article, which appeared in The Photo. Times of the 14th of that month, part of which has ever since been reprinted in the successive "Annuals" and may be found on page 335 of that for the current year.

I called attention therein to the generally unknown fact that a "fluid-ounce" is not the same here as in England, and that, therefore, the "minims" are not alike; so that English tables for the conversion of the Metric system will be more or less incorrect if used with our American-made glass graduates, which should be in conformity to the "U. S. Pharmacopæia," and to facilitate such conversion of weights and measures I prepared a short table which, as above indicated, reappears annually.

I note on the opposite page of the current "Annual" (page 334), a pair of tables which purport to perform the same good office for the English weights and measures; these tables are similar to some on page 943 of the current "B. J. P. Almanack," but are more accurately computed in most part, though, queerly enough, I find the last lines in each table incorrect, or, at least, misleading. Thus, at the end of the upper table to convert Metric into English measure it says:

"1000 c.cm. = 1 liter = 34 fluid-ounces nearly, or 2⅛ pints."

Let us re-compute this: We see that the "c.cm." = 16,896 minims, or, loosely speaking, 17 minims English. The "liter" being 1000 cubic centimeters, it will contain 1000 times 16·896 minims or 16,896 minims.

The fluid-ounce is divided into 480 minims, so that 1 liter holds 35 times 480 minims and 96 minims over; or the liter is equal to 35 fluid-ounces, 1 drachm (of 60 minims) and 36 minims, *not* as in table, p. 334, "34 fluid-ounces nearly." This statement *is* true of U. S. measures only, *not* of the "Imperial" standard. Again, the "2⅛ pints" is also wrong, for the only English legal pint is that called "Imperial," of 20 fluid-ounces.

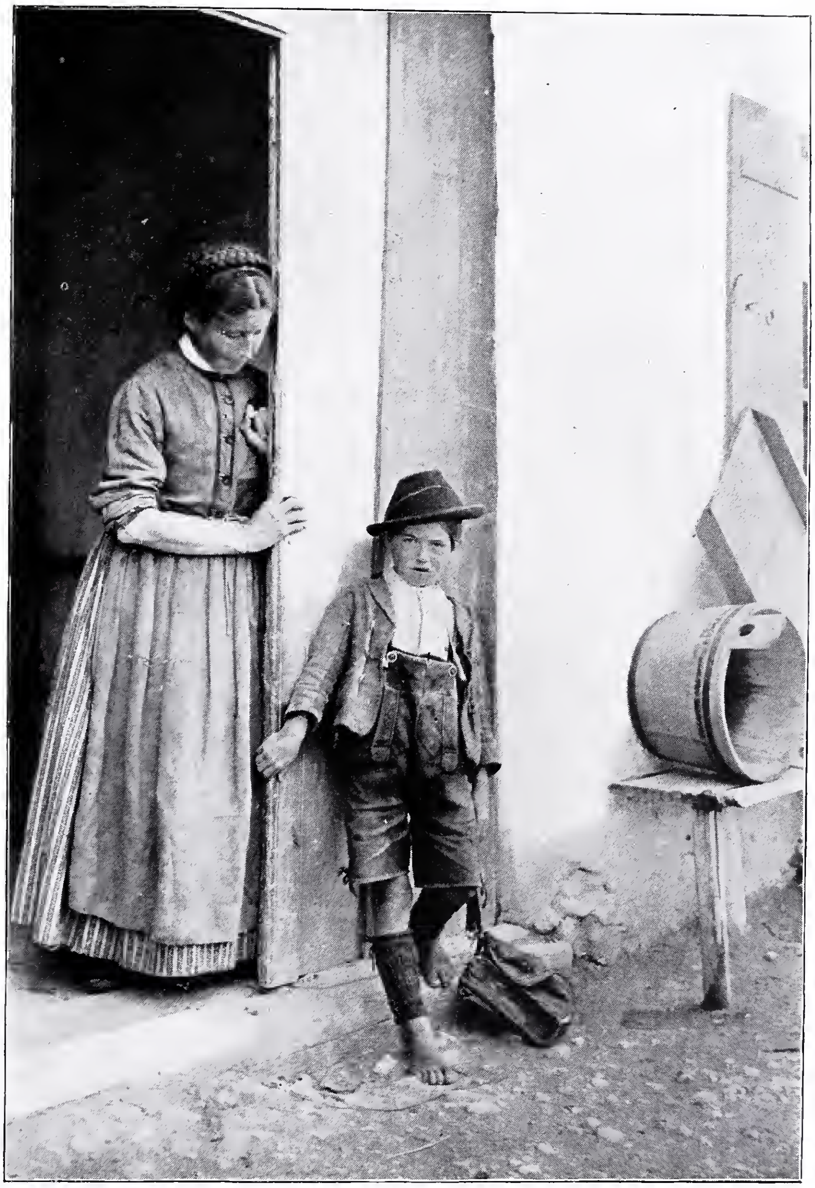
On referring to the lower table, p. 334, if the last line is to be true we must add the word "Troy" to it, for chemicals are always weighed in England by Avoirdupois ounce of 437½ grains, while the Troy ounce of 480 grains is in use only for the metals, gold, silver, etc., of the so-called "precious" kinds, never for any salts of such metals. Thus, if we buy 1 ounce of silver, we may expect 480 grains; if we ask for 1 ounce of the nitrate of silver for emulsion making or the like, we must not growl if we get only 437½ grains to our ounce.

Let me then advise my readers to correct the second table, on p. 334, by writing the words "Troy weight" after the last line, which gives the value of 1 kilo as "32 oz., 1 dr., 12⅖ gr.," and under it write, "or 2 lb., 3 oz, 120 gr. Avoirdupois."

Throughout page 334 the drachms are each 60 minims or 60 grains, according as weights or measures are mentioned, and are curiously used, as a "drachm" ought to be one-eighth of an ounce, which it is in fluid measure only, being one-eighth of 480 minims; in weighing it is out of place in an Avoirdupois ounce of 437½ grains, of which 60 grains is not an aliquot part at all.

If our editor thinks well of it, perhaps the suggested corrections may appear in the "Annual" for 1896.

The "moral" of it all is: how absurd all our queer and complicated weights and measures are, compared with a decimal system as simple as our coinage! My advice to all would be: don't attempt to convert metric into other denominations? Get a cheap set of both weights and measures, which are also sufficiently accurate, and avoid brain-worry and possible error.



"THE TRUANT."
BY ALFRED STIEGLITZ.

ARTIFICIAL ATMOSPHERE.

(*From the British Journal of Photography.*)

IT seems preposterous to expect to obtain atmospheric effect in a photograph when there is none visible in nature. The true idea of distance under such circumstances is only obtained by observing the diminished aspect of objects of known dimensions in proportion as they recede from the point of view. Painters have it in their power to play with atmospheric perspective when there is in reality none appreciable, but this is largely beyond the power of the photographer.

In some countries, and also in our own, under special atmospheric conditions, the clearness is so great as to render it absolutely impossible to even guess at the distance of objects.

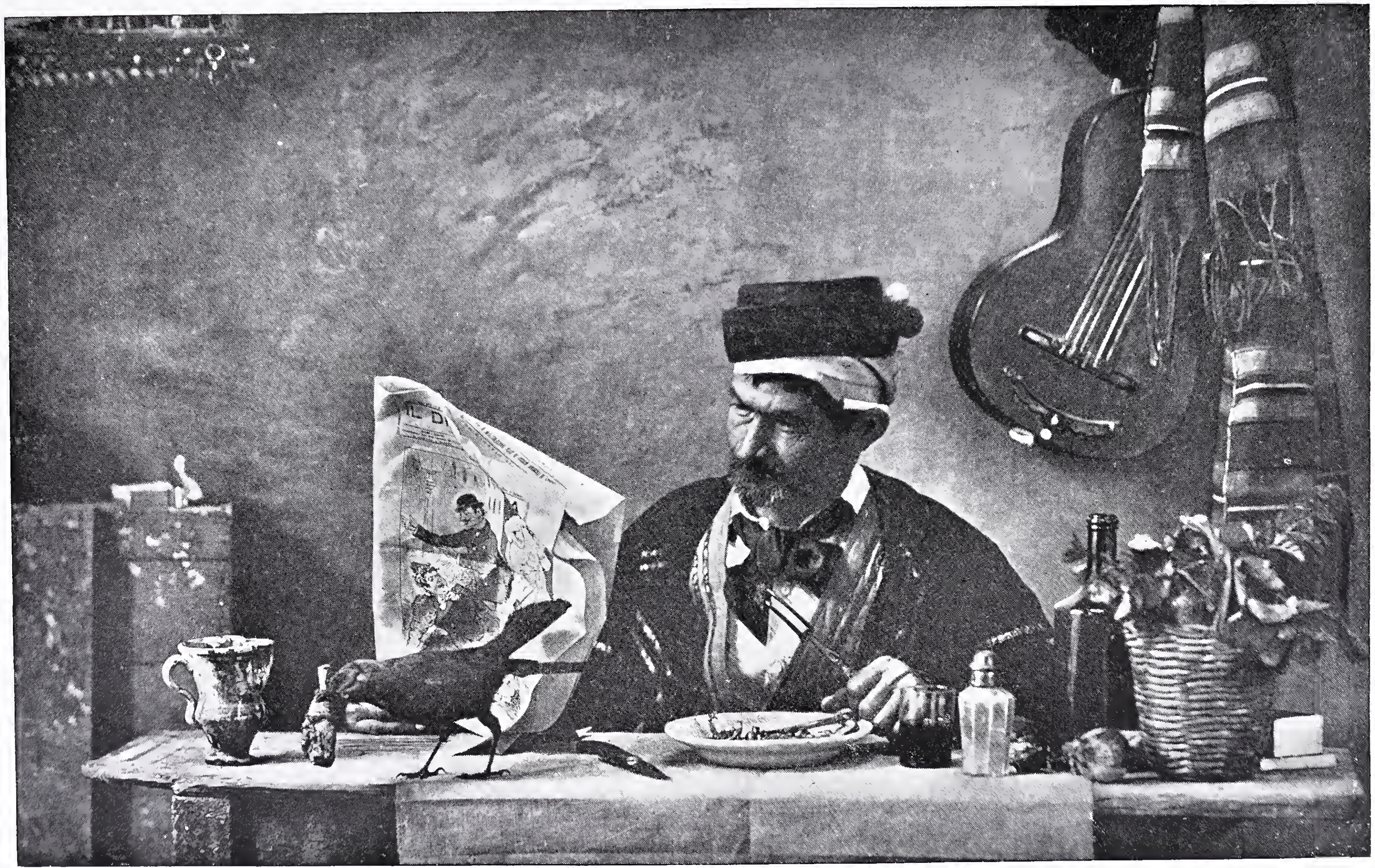
We once knew of a painter and a photographer being present at a certain place with the intention of depicting a particular view, each by means of his special art; but such was the extreme clearness of the atmosphere, that the photographer quite failed in making a picture which conveyed to the spectators a correct idea of the fine gradations of distance by which the scene was characterized; whereas the painter, by introducing atmosphere in varying degrees, according to the distance of the headlands which projected one behind the other at no great distance, managed, by this exercise of his skill, to make each to stand out in bold distinction from the other.

Some years ago we were placed in a position almost similar to that of the photographer just alluded to. It was necessary that we should obtain a photograph of a particular headland, and, as it was required for a scientific purpose —that of showing very distinctly its contour, geology, and flora—it was of importance that it should be well pronounced in each individual feature; but it was found that, in consequence of other groups of trees situated on an eminence about 200 yards behind those which were to form the subject of the photograph, the outlines of the latter were so much interfered with as to render it apparently impossible to take the view in the manner in which it was desired. On the ground glass of the camera the scene that was there represented was one of much confusion as regarded the estimation of distance. A view taken stereoscopically fulfilled the conditions in the most admirable manner, giving the true relations of the distances; but this would not do, as a monocular or single picture alone must be had. By what means, then, could a background be obtained that would separate the desired promontory subject from the intruding scene behind? A happy thought occurred. Procuring a quantity of damp straw, this was divided, and deposited in parcels in a gully which intervened between the promontory that was to be photographed and the subject which it was necessary to exclude, or, at any rate, to subordinate. Everything being in readiness, an attendant boy set fire to the straw, by which a cloud of smoke was emitted, that spread and blocked out the farther scene, and formed a light, hazy background to the nearer promontory. In the finished photograph there appeared only a faint outline of the salient features of the objectionable distance, thus happily deprived of its power of interference with the subject that was wanted.

Subjects which lend themselves to the application of an artificial atmosphere of a nature similar to what we have described are ancient crosses backed by architecture of an ornate nature. A restoration of one of London's ancient crosses was, for the reason given, photographed immediately after a workman had walked behind it, bearing in his hand a brazier filled with ignited wood shavings smothered with sawdust. Any special tree, the outlines of which are marred by others at no great distance behind it, forms a suitable subject for the experiment. By the aid of the substantial smoky atmosphere a tree can, without difficulty, be isolated from its fellows, which need not, however, be entirely obliterated. So with tombstones in a crowded cemetery. Every one who has tried to photograph in a graveyard knows with what difficulty it is that the isolation of any one of these is achieved.

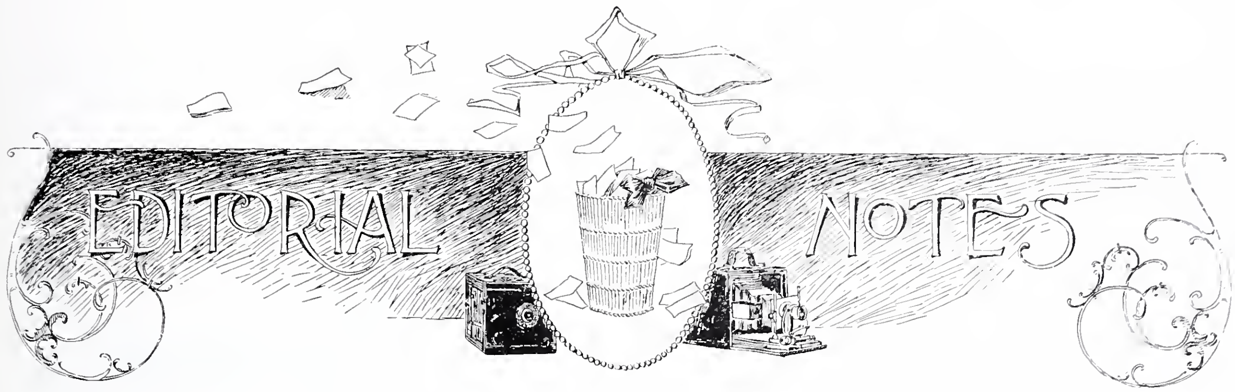
The method here described of subordinating any object that thus would interfere with the proper representation of the chief object, or that to which we desire due prominence being given, far excels the more simple one of stopping out or subduing the undesired portions by painting on the back of the negative with a suitable yellow varnish, leaving untouched such portions as those to which the maximum vigor is desired to be imparted.

For an absolutely eorrect method of rendering gradations of distance, scientifically rather than artistically, the stereoscopic method must be had recourse to.



Electro Tint Engraving Co.

AN UNINVITED GUEST.
BY A. G. TAGLIAFERO.



EDITORIAL NOTES

THE New York Academy of Sciences held its second annual reception on March 13th last. The photographic section was under the direction of Dr. Ed. Leaming, who is to be congratulated upon his efforts to show the latest advance in our art science. There was a good display of photo-micrographic apparatus by Zeiss, Leitz, and other well-known makers. Dr. Frank D. Skeel showed an ingenious device to facilitate focusing with the fine adjustment of the microscope in photo-micrography. A description and sketch of the apparatus will appear in our next issue. The Scovill & Adams Co. of New York exhibited one of their well-known panoramic cameras, which attracted considerable attention. Edison's kinetoscope drew quite a little crowd of persons anxious to see this marvelous device. An equally powerful attraction appeared to be Mr. Fredk. Ives' stereophotochromoscope. The results obtained with this instrument are certainly wonderful.

Optical lanterns and accessories were shown by Messrs. C. Beseler, and Messrs. J. B. Cole & Co.; a telephoto lens by Mr. Henry S. Curtis; some fine examples of half-tone and color work by the Photochrome Engraving Co.; and some photogravure work by the Photogravure Co.

A number of frames containing some recent results in photographic process work from European firms was exhibited by Professor Chandler, of the Columbia College School of Mines.

Among the other important exhibits may be mentioned the reproductions from paintings and engravings, and photographs from life, printed on carbon or porcelain Japanese paper, etc., by Mr. James L. Breese; autotype reproductions by Ed. Bierstadt; impressions of antique gems and seals with enlarged photographs by Prof. Hallock; some lantern-slides of flowers colored by hand, by Mr. and Mrs. C. Van Brunt; and some lantern-slides of photomicrographic subjects, exhibited by Mr. O. S. Strong and Mr. T. M. Cheesman.

In the astronomical section, Prof. E. E. Barnard exhibited some magnificent stellar photographs, taken at the Lick Observatory. They are conceded to be the finest ever produced.

* * *

OUR next issue will contain an interesting article upon the subject of flying projectiles, detailing the work of Prof. Boys and others. It will be illustrated with some curious photographs, showing the disturbances which take place in the air by the passage of the bullet. There will be many other valuable and instructive articles in this issue, which will also contain a fine photogravure reproduction of a photograph by Mr. Alfred Stieglitz, and also a two-tint facsimile of a superb landscape by Mr. Kidson Taylor. This picture was awarded a medal at the recent exhibition held by the Royal Photographic Society in London.

* * *

In our notes in this issue we give some further particulars of the International Prize Competition which will be held at the Royal Agricultural Hall, London, between the 29th June and the 6th July. We shall be pleased to send full particulars and entry forms to any one stating their desire for same. There is every reason to believe that it will be a most successful exhibition, and we should like to see America well represented. Pictures may be sent mounted and not framed. The entrance fee is twenty-five cents per print. We shall be pleased to forward any pictures for this exhibition if despatched to our address before June 2d. Mark packages "For International Competition."

* * *

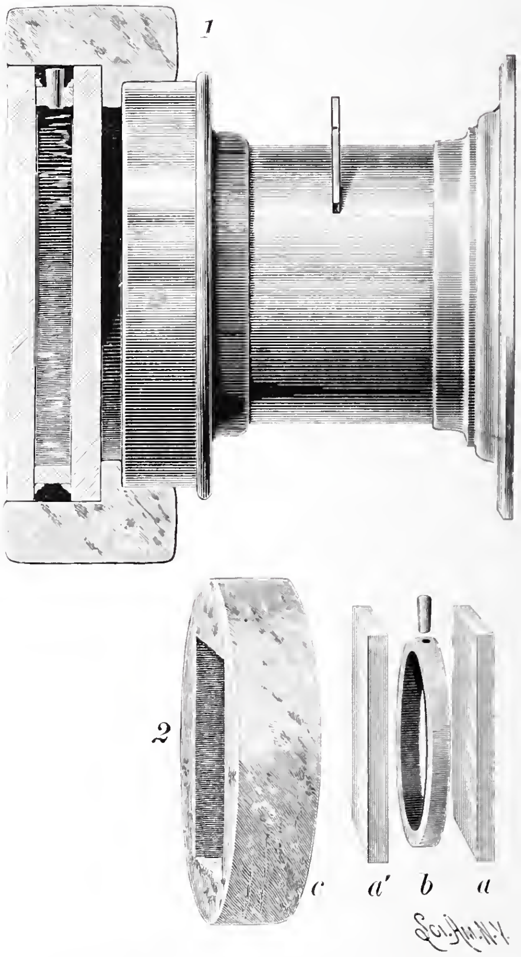
IN the current issue of *Harper's Weekly* appears a reproduction of a flash-light photograph taken from the stage of the Metropolitan Opera House during Max Alvary's 100th performance of Siegfred on March 21st. The picture marks a distinct advance in this style of photography. Every part of the big auditorium is visible, and the great majority of the spectators are so plainly pictured that those who know them will readily recognize them.

The photograph from which the illustration was made is the work of Ernest Marx, and is a flash-light print. In taking this picture the photographer used fourteen ounces of a flash-light powder, so distributed over an iron frame that there were some thirty feet of lighting surface. The charges, thirty-five in number, were placed on an iron frame ten feet square. Back of the flashing apparatus were white cardboard screens. The camera was an 18 x 22, manufactured by the American Optical Co. was fitted with a genuine Zeiss lens. This was placed in the centre of the flashing frame, on the stage, some twenty feet back of the foot-lights. The rapid ignition of a substance which would give out an intensely brilliant flash of light was required for the making of this picture. Under usual conditions the flash-light or the material is fired with a common fuse, and the compound thus ignited is comparatively slow in burning. Mr. Marx's compound, with magnesium as its basis, is made up of various substances. Fired off by electricity in an approved manner ignition is instantaneous, giving a maximum of light.

Mr. Marx's calculation is that the flash took one forty-fifth of a second, and that the efficiency of the actinic light had a duration of one-eightieth of a second.

* * *

Every photographer is aware of the difficulty experienced in photographing clouds. The actinic effect of the whole is so great that unless very rapid exposures are made one loses all apprarance of light and shade. Some of the finest cloud studies we have ever seen have been made at the Weather Bureau at Washington, by Mr. A. J. Henry. But these are not taken in the ordinary way. The method employed is given in a recent issue of *The Scientific American.** The photograph is made through a screen. The one found most effective is that formed of a saturated solution of bichromate of potash inclosed in a plate glass cell having parallel sides. The construction of this cell is shown in the second engraving, in which *a a'* are squares of plate glass, and *b* is a ring cut from a glass tube and ground to render its edges parallel and smooth. One side of the ring is perforated and furnished with a stopper. The ring is cemented between the two glass plates with balsam of fir or other suitable cement. The saturated solution of bichromate of potash is introduced through the perforation, and the cell thus made is inserted in a piece of cork, *c*, which fits over the collar of the camera lens. The proper thickness for the cell is shown in the engraving; the diameter will of course vary with the size and the angle of the lens. The exposure required for the negative is usually about four seconds.



BICHROMATE CELL FITTED TO LENS.

* * *

According to the *Bulletin de la Société Belge*, Lumière Brothers and M. Seyewitz, in France, have been experimenting with a view of finding a substitute for caustic alkalies or carbonates in alkaline developers, and have found that tribasic phosphate of soda offers none of the disadvantages possessed by these substances. They found:

1. With an amount of tribasic phosphate of soda equal to the amount of crystallized carbonate of soda, in every case negatives more intense than when carbonate of soda was employed were obtained in the same time.

2. The rapidity of development increases very quickly with the strength of the tribasic solution, and only slowly if the development is

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* We are indebted to the kindness of the publishers of this excellent magazine for the loan of cut illustrating the apparatus.

forced with the carbonate. Moreover, in the latter case, the gelatine is liable to be attacked and detached from the plate, which does not happen when the phosphate is used. In all developers except paramidophenol, which is less soluble with phosphate of soda, it will be advantageous to substitute for carbonate of soda at least an equal weight of tribasic phosphate of soda. This amount may be doubled if necessary for an under-exposed plate.

Lastly, a saturated solution of tribasic phosphate of soda (18 per cent.) may be used with ordinary developers for an accelerator.

Note.—The solubility of tribasic phosphate being only about 1 : 5 in cold water when greater strength is required, warm or tepid water should be used and added to the developer, allowing the latter to cool before use.

The authors recommend the phosphate of soda in the proportion of 133 parts as a substitute for 100 parts of carbonate of soda, and express the opinion that eventually tribasic phosphates will replace caustic alkalies and carbonates.

* * *

In the April number of The Photographic Times there appeared a brief description of a new sensitometer said to be due to Dr. Scheiner, of Potsdam. Regarding this, Prof. G. W. Hough, Professor of Astronomy in Northwestern University and Director of the Dearborn Observatory, writes:

"I find that the instrument, so far as it goes, is precisely identical in principle to a sensitometer I invented in 1884, and described in *Photography*, July 1, 1884; at the Philadelphia meeting of the A. A. A. S.; in the *Photographic Beacon*, November, 1885, and in subsequent papers.

"The shape of the opening, in the revolving disk used by Dr. Scheiner, is identical with that employed by myself in my first instrument. During my early experiments I used a scale 0 to 20, which was found to be too short, when passing from wet-collodion to the most rapid emulsion plate.

"Scales from 0 to 50—100—500, and finally 0 to 1000 were subsequently used.

"My sensitometer consists of a disk, having a suitable opening, and revolved by clock-work in front of two scales; one having a series of numbers on white paper and the other a similar series on a glass plate.

"The first series is for use with a camera and daylight; the second for any kind of artificial light or very feeble daylight.

"If a camera is used, the revolving disk should be covered with black cloth to prevent deposit from the disk itself. When used with the second scale, a piece of sensitive plate is placed behind and in contact with the scale and the disk is revolved for a definite time in front of a standard light placed at a definite distance. The smallest number that can be read will give the absolute time required for that plate and light to make a legible impression.

"For ascertaining the relative sensitiveness of plates in white light, photographs of the lower scale are successively made for different plates. In composing plates very unequal in sensitiveness, like wet-collodion and rapid emulsion plates, unequal stops may be used in the lens, or different times of exposure given, or both. In order to avoid errors incident to imperfections in the apparatus, it is desirable to have the minimum number visible in full on the same part of the scale for any set of comparisons.

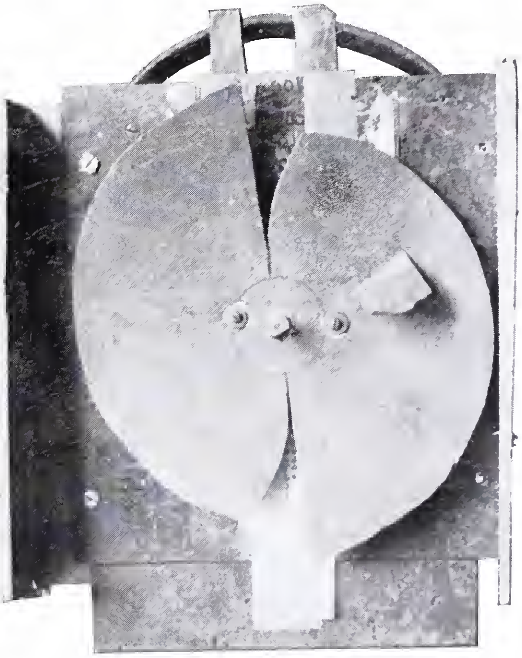

FIG. 1.—PROF. HOUGH'S SENSITOMETER.

"Owing, however, to the effect of preliminary or supplementary exposure, all forms of sensitometers hitherto used, which depend on the minimum visible, are subject to considerable error unless very great precautions are taken in the manipulation of the plate during exposure and development. Fig. 1 shows the sensitometer as now used; the upper scale is for use by contact, the lower for the camera."

It is evident that if any credit is due to anyone for this invention, Prof. Hough is entitled to a very large share.

* * *

Mr. R. D. O. Smith, in his article upon the first stereoscope in Connecticut, states that stereoscopic effect can be obtained without lenses, by teaching the eyes to look straight ahead independent of each other. While we admit the possibility of this we do not indorse his recommendation to try the effect. The unnatural strain upon the muscles of the eyes is likely in some cases to cause injury. We, ourselves know of a case where a person was endeavoring to perform a similar marvelous feat with her eyes and the result was a permanent squint.

* * *

Herr Von Schoeller, in a recent issue of the *Wiener Photographische Blätter*, gives his method of preparing platinum paper for various kinds of negatives. As is well known, the ordinary paper requires a negative possessing certain qualities to obtain good results. The method here given, however, permits of good prints being made from thin or hard ones. He prepares the three following solutions:

1. Platinum Solution.

Water	60 c.c.
Potassium chloroplatinite	10 grammes

2. Iron Solution.

Water	100 c.c.
Ferric oxalate	20 grammes
Oxalic acid	1·5 grammes

3. Chlorate and Iron Solution.

Potassium chlorate	0·4 gramme
Iron solution (No. 2)	100 c.c.

To sensitize the paper, the above solutions should be mixed as follows:

For hard negatives:

Platinum solution	24 c.c.
Iron solution	22 c.c.
Water	4 c.c.

For normal negatives:

Platinum solution	24 c.c.
Iron solution	14 c.c.
Chloride and iron solution	8 c.c.
Water	4 c.c.

For flat negatives:

Platinum solution	24 c.c.
Chloride and iron solution	22 c.c.
Water	4 c.c.

It is very important that a well sized paper is used. The coating must be as uniform as possible and dried quickly, otherwise the prints will have a sunken-in appearance.

Many attempts have been made to devise a machine by which negatives may be dried in the shortest possible time. The most successful have been those which, by a centrifugal motion, create a strong current of air which takes away the moisture much sooner than by applying heat.

It is not generally understood that the drying of a negative has a great influence upon its character. If it is dried as quickly as possible the result is a pluckier negative richer in contrasts. Most amateurs make the mistake of placing the negative near some heating arrangement, often with the result that the film is softened or melted.

A better method than this is to stand the negative on the windowsill with the window open, so as to have a free current of air passing over it. It will dry much sooner. The possibility, however, of the negative falling from the windowsill to the ground below is a decided disadvantage, and if one is located on the twenty-second story of a modern New York building the chances of its reaching the ground without injury are somewhat small.

The most suitable apparatus that we have noted for the studio or for those making a large number of negatives, is the one devised by Mr. F. M. Pickard and described in the *Revue Universelle*.

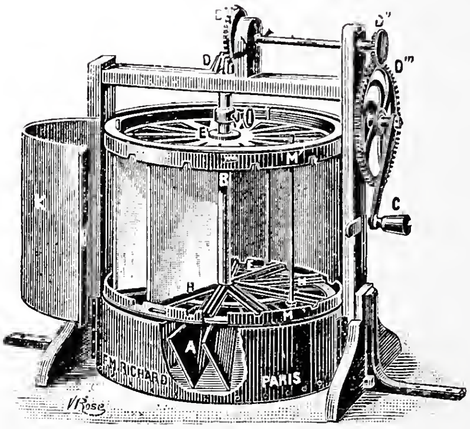

Fig. 2.—F. M. Pickard's Centrifugal Negative Dryer.

The apparatus consists of a fin with wings, A (Fig. 2), secured at the bottom of a vertical shaft, B, driven by gears and pinions D, D′, D″, D‴, which are in turn operated by means of a crank, C, or by an electric or water motor, etc.

The plates to be dried are inserted between two disks, E and E′, loose on the shaft, and which are provided with grooves, H, H, to hold the plates. The upper disk, E′, is adjustable vertically, and can be secured by means of a screw, I, by which the disk may be secured to the shaft B. These vertical rods connect the disks, and serve to secure the coincidence of the grooves in the upper disks with those in the lower. Further, a grooved flanged disk, M, M′, which may be displaced circumferentially serves to lock the negatives in place.

To operate the apparatus the side, K, is swung back. The upper disk is raised sufficiently to allow the introduction of the negative. The grooves in the disk, M, M′, are then brought to such a position as to secure the negatives. The negatives should be placed with the gelatine side away from the current of air produced by the fan. The side, K, is then closed. If now the thumb-screw, I, is not screwed up, only the fan is set in motion; consequently the air, drawn in at the central opening in the back, will be forced violently against the walls of the cylinder and thrown back by the cover at the upper end, under a current of air of this strength. The water contained in the gelatine films on the plate will be soon evaporated. When the gelatine is dry on the edges of the plates, the detaching of the film from the plate is impossible, and the thumb-screw, I, may be screwed up, the plates thus being revolved along with the fan, without danger that the film will be disturbed. In a few minutes the plates are dry enough for printing by contact. A gelatine plate, developed and worked for twenty-four hours, may be dried sufficiently for printing by contact in fifteen minutes after being placed in the machine, if allowed to drain for a minute before being placed in the latter. The same machine may be used for drying plates which have been varnished, or which have been immersed in an orthochromatizing solution.

* * *

By Horace P. Chandler.

FOUR OF A KIND.

A PLEA FOR STANDARDS IN PHOTOGRAPHIC APPARATUS.*

BY S. ASHTON HAND.

From the building of the Tower of Babel came the confusion of tongues, and all things inanimate have been in more or less confusion from that time to the present day. But as civilization progresses, order is being gradually brought out of chaos.

Until within the past thirty years it was the practice of machine makers to use odd sizes and pitches of screws in their products. A given screw was designed especially to differ from any other screw that had been produced by any other man. The idea being that repairs should bring grist to the maker's mill, and not to any one else's mill.

Fortunately, this theory has long since been exploded, and a standard system has been adopted by all progressive manufacturers not only for screws, but for all component parts of machines or implements. So thorough is this system of standards, that it is possible to go in a modern sewing-machine factory and take apart a thousand machines, throwing the various parts into a promiscuous pile, and then to put together a thousand perfect machines from parts taken at random from that pile.

Photographic apparatus generally is entirely devoid of any such system.

The writer has three Beck lenses which will all screw into one flange. If the flange is mounted on the lens board of the camera so that one of these lenses can be put in place with the diaphragm slot in the proper position, the diaphragm slots of the other two lenses will be anywhere but in the right positions when screwed into this same flange. This necessitates the use of three separate lens boards and flanges.

All of these lenses were sent to Bausch & Lomb to be fitted with shutters, the original lens tubes, but only one flange, being sent with them. No one of these shutters attached to these lenses will stand in an upright position, nor in the same relative position one to the other, when screwed into the flange on the before-mentioned lens board.

If these three lenses are to be used both with and without shutters, and required to stand in their proper positions, it will necessitate the use of six flanges and six lens boards where one of each should suffice.

An English firm has undertaken to correct this difficulty by furnishing a standard set of flanges and adapters. This is all very well for the lenses now in existence, but why should not the manufacturers adopt a standard for the lenses and flanges that are to come, so that a lens of a given focus, no matter by whom made nor where purchased, will screw into any other flange made for any other lens of the same focus and have the diaphragm slot in the proper position?

Tripod screws and their stationary nuts are not interchangeable. The screws on the average tripod are too long and too small in diameter to hold a 4x5 kodak, and are too short by one-quarter of an inch to hold the regular Eastman camera. They are also too large in diameter to go in the stationary nut on the Blair English compact camera.

Plate holders by one maker should fit the cameras of same size by any other maker. So should lens boards.

Dark slides of one size plate holder should fit any plate holder of the same size in the market.

Sensitometer numbers of dry plates mean absolutely nothing. They should be systematized so that the slowest plate should be designated by unity and the faster plates by multiples thereof, in such uniform manner that a plate of say 25 sensitomers will be twenty-five times as fast as a plate of 1 sensitomer, and all plates of same sensitometer numbers should have the same speed. Then can we be more sure of time of exposure without taking into account the few odd thousandths of seconds now necessary for correct exposure.

It has been shown by reports at former meetings of this Society that the plate makers collectively will not agree to do anything, except to compel us to buy what they choose to make.

Taking all things into account, the writer is strongly of the opinion that manufacturers of photographic apparatus in general and dry-plate makers in particular, are the result of a sort of Mephistophelian cross with a Colorado mule.

But a day of reckoning must come, and when it does come manufacturers of photographic apparatus will awaken to the fact that they will have to give the public what the public wants.

Cognizance of the needs of the general public and a readiness to supply those needs is the power behind the throne that has built up the enormous trade of our largest establishments.

The need for all these reforms does not constitute my special tale of woe nor your special tale of woe, but it does constitute the tale of woe of photographers generally all over the land.

How the multitude of sizes and shapes of plates originated is beyond the comprehension of man. Each original maker must have made his own measure out of a piece of hoop iron, and used a tenpenny nail to graduate it with.

The writer specially pleads for a standard size of plate from which all other sizes of plates can be derived by simple multiplication or division, and which shall be of such proportion that, when halved and quartered, the progeny thereof shall still retain the same proportion as the parent plate. That is to say, that if all the different sizes of plates shall have their left hand and lower edges brought into coincidence, and a diagonal line be drawn from the lower left-hand corner extending through the right-hand upper corner of any one of the plates, it shall then pass through the right-hand upper corner of all the plates. Such a diagonal line will be approximately 35¼ degs. from the horizontal, and the proportion of the plate will be as 1 is to 1.4142.

The size of plates now on the market that comes nearest to fulfilling these conditions is 5 x 7.

A standard unit size of plate can easily be deducted either by simple calculation from the above formula, or graphically by the diagonal line of 35¼ degrees before referred to.

The advantages of plates of such proportions are obvious. When plates of a certain size are not in stock they can be cut from any of the larger sizes without waste. Storage room for plates and negatives can be more easily and economically devised. Two negatives of one size can be put into the next larger sized printing frame at once, and fewer sizes of sensitized paper need be kept on hand.

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* A paper read before the Photographic Society of Philadelphia, February 13, 1895.

That most if not all the photographic apparatus of the near future will be made to agree with some rational standard is not doubted by the writer, and it is earnestly hoped that this Society will take such action in the matter as will leave no doubt that to them will belong the credit of having originated the system of standards that shall ultimately be adopted.

* * *

DAME NATURE.

BY H. P. ROBINSON.

(From the *Camera and Lantern Review*.)

Let us consider Nature in relation to our art. Nature is raw material which in our alchymical cameras we convert, when successful, into pictures. The camera, or the user of it, should be the predominant partner.

Nature bears the same relation generally to other means of art as to photography, but photography, although one of the most exact means of representing, is also, and partly because of it, one of the most limited means of interpreting Nature. Photography is constricted by compulsory truth. This truth is often used as an excuse for misinterpreting Nature.

Fact is always solid and self-satisfied; truth is often satisfied and at her best when merely suggestive. Truth is often more beautiful when merely hinted than when proclaimed from the housetops. Truth is never beautiful when blatant. Fact is often intolerable.

Accept all the help that Nature will give you, but don't set her up as a fetish. Our good editor (I stop to congratulate him on the vast improvement in his magazine) used to take as his motto Wordsworth's line,

"Let Nature be your teacher."

but now wisely omits it. It is a pretty sentiment, and not altogether bad if taken in a wider sense than what it was meant. Let Nature teach you what to avoid as well as what to select and the teaching would be admirable. But Nature knows nothing of art. Wordsworth himself, when he confined himself to pure poetry in "Intimations of Immortality," was a greater artist than when he descended to Naturalism in "Peter Bell" and other verses, which are all Nature and no poetry. What we want is a work of art, not an imitation of Nature. An exact representation of Nature, if we could get it, would be a great curiosity, but not a picture. But, as a matter of fact, a close imitation of Nature is an impossibility. Nature resents the flattery and makes it ugly. The student who hopes to compress some miles of chromatic nature into a few inches of monochrome photograph is of a sanguine disposition. The true artist feels about the matter as Shakespeare did about his representation of Henry the Fifth's army,

> "And so our scene must to the battle fly,
> Where (O for pity) we shall much disgrace—
> With four or five most vile and ragged foils,
> Right ill disposed, in brawl ridiculous—
> The name of Agincourt."

Yet "by his most potent art" the great poet gave a wonderful *impression* of the famous battle.

I recollect, many years ago, reading a line by a writer who was in advance of his time. It ran something like this: "Before you think of art in connection with photography, pray get rid of the notion that you can give an imitation of magnificent Nature by covering a small piece of pink albumenized paper with a platitude of sharp detail."

On the other hand, you must not defy Nature. Study her for all she is worth. Get all you can out of her. Learn at least some of the visible secrets of the earth you photograph. I have even found geology and astronomy great aids to pictorial effect Some knowledge of the latter once saved me from representing a three-quarter moon upside down. You cannot know too much about the sky. Excuse me for suggesting that in your present state of knowledge or ignorance you do not know the difference between a sunrise and a sunset. Read awe-inspiring books that are sentimental but teach not; go into ecstacies; worship open-mouthed if you feel it does you good; but in attempting to produce artistic effect let *Art* be your teacher rather than Nature. There could not be a more devoted naturalist and nature-lover than myself; but in picture-making I cannot help looking upon her as the sitter who must not dictate, rather than the artist or teacher. She knows nothing of composition, or light and shade, yet we are always finding beautiful, wonderful and grand scenes. These are not the result of intentional art on the part of Nature, but it should be the photographer's business to secure Nature's flukes, and convert them into his own deliberate results. Rob Nature always She never minds, but keeps on smiling or frowning. She sometimes looks stupid when she is doing neither.

Nature never cares whether she has a sky or a foreground; the photographer should take care that the bit of her he selects has both, and it is in these departments he has most control. An artist ought to be able to teach Nature a lot about the use of the sky in a picture. Photographers sometimes let her have her own way; and she sometimes, it must be admitted, flukes a success, but it is not safe to rely upon her. She sometimes offers you a good foreground; make the best of her good gifts and reject the bad ones, but don't take the good too much for granted. It may be "good enough," but good enough is only tolerable and not to be endured. The best possible should be the thing demanded.

But I feel that I am becoming irreverent and Nature may turn her back on me if I am not careful.

* * *

THE STEREO-PHOTOCHROMOSCOPE.

BY F. E. IVES.

Photographic Society of Philadelphia:

The original Ives photochromoscope, although only a monocular instrument, contained seven reflectors, six lenses, and three color screens—sixteen optical working parts altogether. The new stereo-photochromoscope has only six optical working parts—four pieces of colored glass and two lenses.

Such simplification of the photochromoscope was made possible only by adopting chromograms, which are made in sections, on different pieces of glass; and I rejected that plan as unsatisfactory until it occurred to me that the sections might be hinged together and used in such a way as to be almost as convenient to handle as the one-piece chromogram. In order, however, to change such chromograms quickly, an instrument had to be devised which would permit the sections to be dropped into their respective places by a single movement of the hand like the one-piece chromogram in the older photochromoscope. This I accomplished by making some important improvements upon a crude suggestion thrown out by Charles Cros nearly twenty years ago. I have lost the reference to Cros' publication, but if my memory serves me well, it was a suggestion to blend three colored images by the use of one mirror and two pieces of plane glass arranged as shown in the vertical section, Fig. 1: A is the position of the eye; B, C, clear plane-glass reflectors; D, silvered mirror; E, F, G, colored glasses; H, I, J, photographic positives.

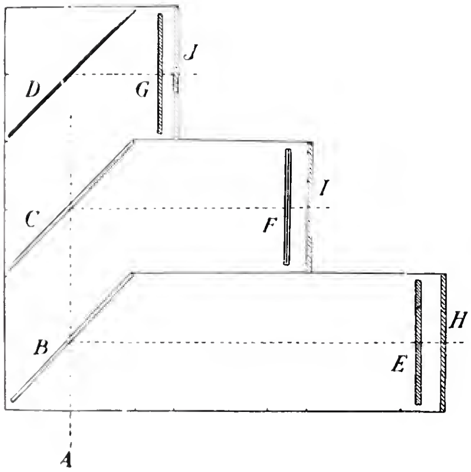
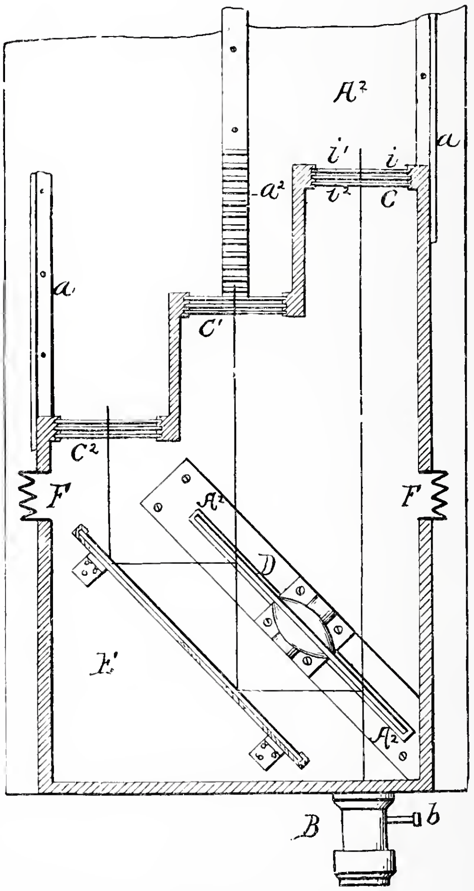


FIG. 1.

It was not claimed for this arrangement that it was of any use except as an experimental demonstration, because the plane glasses gave double reflections, which destroyed the definition of the images. Some years after, Antoine Hippolyte Cros sought to find a substitute for the plane glasses which should be free from the defect: and by means of a rapidly revolving wheel having four plane silvered and two clear open sectors in combination with another plane silvered mirror, actually blended three images without any doubling of outline. The arrangement is shown in the vertical section, Fig. 2. At one instant of time the light passed directly from C to the eye, through an open sector; at the next, light from C1 passed through an open sector to the mirror E, then on to a silvered sector, and from that to the eye, at the next, light passed from C2 to the mirror E, then to a silvered sector, then back to the mirror E, then on to another silvered sector, and from that to the eye. The wheel (Fig. 3) was put into motion by means of a wound-up cord as for spinning a top. Such an instrument would necessarily be large, clumsy, costly and troublesome, and I do not know that Cros ever even showed one in public; but it is of interest as being the first suggestion of an instrument even theoretically capable of producing such a blending of the images as it was intended for.

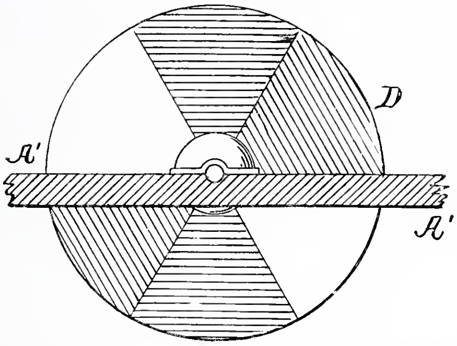
What Antoine Hyppolite Cros sought to do for the step form of photochromoscope by means of his revolving wheel, I accomplished far more perfectly by a means which in comparison is ridiculously simple, namely, by substituting colored glass reflectors for the ordinary plane glasses used by Charles Cros. As I pointed out in a paper red before the Society of Arts in London, in May, 1893, the images will not appear doubled if the blue picture is reflected from a yellow glass and the red picture from a cyan-blue glass. But not even the folding chromogram and the colored glass reflectors were sufficient improvement to make of it a satisfactory working instrument, because the perpendicular position of the stops was unsuitable for the ready insertion of the folding chromogram, and also necessitated either a duplication of parts or enormous increase of size to make it stereoscopic. The arrangement was also very unfavorable for securing suitable illumination. All of these defects I remedied by making what was formerly the base of the instrument one of its sides, and hinging it to a base board or tray, so that it could be readily in-

FIG. 2.



clined to the most favorable angle for illumination and easy vision. Still another defect remained; the image, owing to its distance from the eye and the small angle subtended, appeared much smaller than that in the original Ives' photochromoscope. This defect was remedied by changing it to a two-step instrument, in which the first image is not reflected at all, but seen direct through the two colored glasses which reflect the other images. Such an instrument is shown in Fig. 4, and the folding chromogram in Fig. 5. A sectional view of this instrument is shown in my United States patent specification, filed July 3, 1894, and issued December 18th Owing partly to the shorter distance from the eye to the chromogram, and partly to the fact that a more convex eye lens is required for distinct vision, the image has apparently four times the area of that seen in the three-step instrument, and the objects appear "life size."

FIG. 3.



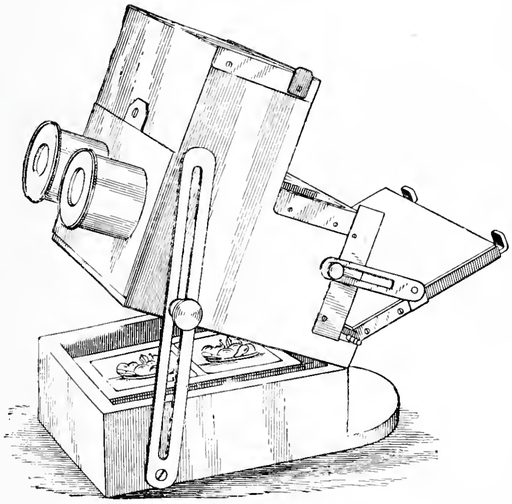


FIG. 4.—THE STEREO-PHOTOCHROMOSCOPE.

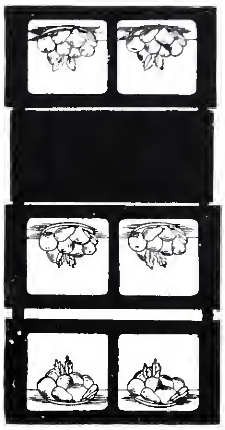


FIG. 5.—THE CHROMOGRAM.

The chromograms unfold automatically as they are picked up, and fold up again as they are laid down by giving the hand a slight to and fro motion. They are dropped into place in the photochromoscope by a single motion of the two hands and lifted out by a single motion of one hand. The negatives and positives are made, in the first place, on a single 5 x 7 plate, the positives being cut twice in two for mounting on the hinged cardboard frames.

THE PHOTOGRAPHERS' ASSOCIATION OF AMERICA.

The Executive Committee of the P. A. of A. sends us the following plan of reorganization of the National Association, to be submitted and acted upon by its members at the Detroit Convention.

They recommend the reconstruction of the "Constitution and By-Laws," as being the most commendable for future success of the States and National Associations.

The existence of the various State Associations makes it necessary to change the laws and government of the National. Their purpose, as stated, "is not to jeopardize the interests and welfare of the States, *but to aid them*, and to maintain and stimulate a still higher standard of photography in the future."

They say that, whereas the advancement of the art of photography and the elevation of the professional character of its members, the establishment of a higher and more perfect system of conducting the business of photography, the promotion of friendly intercourse and feeling, and the unity of purpose in pursuing the direction that points to its greatest success as an art, therefore we, the members of the Convention now assembled in Detroit, Mich., August, 1895, composed of photographers from various sections of the United States, do now adopt the following Constitution and By-Laws:

CONSTITUTION.

Article I.

This Association shall be called the Photographers' Association of America. Its aim shall be to encourage the various State organizations, and to promote a friendly intercourse of feeling among such State organizations, and to further unite and encourage the photographers of the United States and Canada in the following objects:

1st. To establish the relations between members of the profession and the people at large, upon just and business principles, which shall promote public welfare, and be of mutual advantage.

2d. To improve the science and art of photography by diffusing scientific knowledge among its members, fostering photographic literature, stimulating discovery and invention, and encouraging the production and manufacture of all articles required for photographic use.

3d. To discourage and oppose any unjust opposition which tends to hamper the progress of the art.

Article II.—Structure of the Association.

Section 1. The Association shall be constituted as follows:

Paragraph 1. Such State Associations as shall become members of the National Association.

Par. 2. Such individual members of States and Territories where no State or Territorial organization exists.

Par. 3. Such photographers, inventors, and scientific men who may be deemed worthy of distinction to membership.

Sec. 2. No change shall be made in the structure of the Association as above established, save by amendment of this Constitution.

Article III.—Membership.

Section 1. The membership of this Association shall consist of regular and associate members.

Paragraph 1. Regular members shall be such members of State organizations who are photographers in good standing, or such photographers who reside in a State or Territory where no State or Territory organization exists.

Par. 2. Associate members shall consist of manufacturers of photographical materials, dealers in same, and their representatives and employees.

Par. 3. All present and past Presidents of State Associations who become members, shall be considered ex-officio members of the legislative body of this Association.

Artbcle IV.—Powers.

Section 1. Legislative powers shall be invested in the National Association, which shall be composed as follows:

Paragraph 1. The officers, as provided in this Constitution.

Par. 2. The National representatives legally elected, appointed or selected.

Sec. 2. The officers of the National Association shall be as follows: President, First Vice-President, Second Vice-President, Secretary, and Treasurer, who shall be elected triennially as provided by law, and shall hold office for the term of three years, or until their successors are duly elected and installed.

Sec 3. National representatives shall be elected by the State Associations in the same manner as State officers are elected.

Sec. 4. The term of a National representative shall be three years next succeeding his election or appointment.

Sec. 5. Resignation of membership shall be in writing to the Secretary or Treasurer. All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the next regular meeting of the Association.

Sec 6. Eminent men in the United States and other countries, inventors, photographers, and other scientific men who may be thought worthy of the distinction, may be elected honorary members; they shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at a meeting.

Article V.—Officers and their Duties

Section 1. The duties of the President shall be such as usually devolve upon the presiding officer of a deliberative or parliamentary body.

Sec. 2. In the event of the temporary absence or inability of the President, the First Vice-President shall succeed to the duties of the President; should the First Vice-President be absent, the Second Vice-President shall discharge the duties of the President

Sec. 3. The duties of the First Vice-President shall be to take charge of the Art Exhibits at Conventions, and perform such duties as will insure the prosperity and welfare of the Association.

Sec. 4. The Second Vice-President shall have charge of the Instructive Sessions at Conventions and shall be considered Chairman of all committees appointed for such purposes.

Sec. 5. The Secretary shall keep fair and correct minutes of the proceedings of the meetings, and carefully preserve on file all reports, essays and papers received by the Association, and shall be charged with the necessary foreign and scientific correspondence· He shall receive 5 per cent. of the gross receipts as full compensation for his services. Any moneys collected by the Secretary shall be immediately turned over to the Treasurer, taking his receipt for the same. He shall make an accurate and detailed report of the business of his office in time to be audited at the annual meeting of the Executive Committee.

Sec. 6. The Treasurer shall collect and take charge of the funds of the Association. He shall pay no moneys except by order of the President and Secretary. He shall present a statement of his accounts at each annual meeting of the Executive Committee. The Treasurer shall receive 5 per cent. of the gross receipts as full compensation for his services.

In case of absence of the Treasurer, he shall appoint a deputy with power of attorney to fulfill his duties. The Treasurer shall be required to give an indemnity bond that shall be deemed sufficient and satisfactory to the members of the Executive Committee, and said bond shall remain in the custody of the President of the Association.

Article VI.—Board of Trustees and Standing Committees.

Section 1. The Board of Trustees shall consist of the President and the two Vice-Presidents.

Sec. 2. The Executive Committee shall consist of five officers, as heretofore enumerated, and they shall have charge of the general affairs of the Association.

Sec. 3. A Committee on the Progress of Photography, consisting of three members, shall be appointed by the President at each Convention, who shall make a report in writing at the next regular Convention.

Sec. 4. A Committee on Credentials, consisting of the President, Treasurer and Secretary, shall exist, whose duty it shall be to pass upon all questions involving the right of membership and representation.

Article VII.

Section 1. The revenue of the National Association shall be derived from State Association tax, membership dues, voluntary donations, and the sale of space at Conventions.

Article VIII.

The meetings of this Association shall be held triennially, as hereafter provided.

Article IX.—Amendments.

The Constitution may be altered or amended by a vote of three-fourths of the members present at any regular meeting, and notice to alter or amend the same shall be given at least one sitting before a vote can be taken thereon.

A copy of the amended By-Laws of the Association can be obtained on application to the Secretary, Mr. J. Ed. Rösch, 1203 Olive Street, St. Louis, Mo.

* * *

Jul. Freih. v. Waldberg.

NOTES.

The Editor will be in Europe during May.

The British Photographic Convention has been fixed for July 15th to 20th.

The Electro Tint Engraving Co. of Philadelphia, Pa., are producing some fine half-tone plates.

Pirie Macdonald has resigned his position as Secretary to the P. A. of A., owing to pressure of business matters.

Dr. Samuel B. Ward gave an interesting lecture upon Tri-color Photography, before the members of the Albany Camera Club.

Rudolph Boerland gave an interesting lecture upon the "Art of Photography" before the Scientific Association of Peoria, Ill.

"The Practical Photographer," for April, is a most interesting magazine. It contains a large number of animal studies, both interesting and amusing.

Obituary.—We regret to note the death of James Wilcox, father of L. H. Wilcox, photographic merchant of Brooklyn. He was killed at Mamaroneck, March 19th, by the train.

Alfred C. Kemper has sailed for England to establish a London agency for the Kombi camera, under the management of Messrs. Adams & Hayden, 36 Oxford Street, London.

"The Camera and Lantern Review" makes its appearance in a much improved form. It will in future be issued monthly as an illustrated magazine under the able editorship of Mr. Chas. W. Hastings.

"Electricity" is an up-to-date magazine. It is ably edited and contains much that will interest photographers. Our article on pictorial telegraphy and the illustrations accompanying it are from a recent issue.

Prof. E. S. Holden, the director of the Lick Observatory and a contributor to this magazine, has been made a Commander of the Order of the Ernestine House of Saxony, in consideration of his services to science.

Mr. E. F. Hall, the well-known Buffalo Photographer has opened a new studio on Virginia Street, near Delaware Avenue. From the photographs we have seen it is evidently one of the handsomest and best arranged studios in this country.

The Robt. Dempster Co., the well-known firm of photographic merchants, will open at 1213 Farnham Street, Omaha, Neb., with a complete new line of photographic merchandise. The Des Moines house will continue as before. We wish them every success in their new enterprise.

The illustration of the two thieves which appeared on page 131 of this magazine, we understand, originally appeared in *Wilson's Magazine*. Had we known this we should have given credit to that journal notwithstanding the fact that we purchased the cut from an entirely different source with full permission to use it in any way we chose.

Wilfred A. French.—A group of thirty-three photographs by this artist was recently placed on private exhibition in the gallery of the Boston Art Club. These pictures were awarded the only silver medal given to foreign exhibitors at the winter exhibition of the Societá Fotografica Italiana, at Milan. This is the 27th medal that Mr. French has received.

The Photographic Society of Philadelphia, at its last meeting, elected ten new members, of whom four were ladies. This is an inovation, as the Society during its thirty-three years of existence has been composed exclusively of men. However, as the most flourishing Societies in other American cities include both sexes in their membership, the departure is expected to prove popular and beneficial in various ways.

Cornelius Van Brunt, the well-known amateur photographer, repeated, by request, his lecture delivered before the Torrey Botanical Club on February 27th, entitled "Wild Flowers in and About New York City," at Hardman Hall, Fifth Avenue and 19th Street, on Wednesday evening, April 3d, last. The lecture was illustrated with beautifully executed lantern slides made from nature and most artistically colored by Mrs. Van Brunt.

Orange Camera Club.—At the annual meeting held March 20th, the following officers were elected: For President, Wm. H. Cheney; For Vice-President, Edward H. Graves; For Treasurer, Charles A. Lindsley; For Secretary, Alfred C. Bode; For Chairman House Committee, H. E. Matthews; For Chairman Finance Committee, Herman Joerns; For Chairman Membership Committee; H. R. Halsey; For Chairman Lantern Slide Committee, H. R. Terhune; For Chairman Library Committee, C. W. Baldwin.

The Society of Amateur Photographers of New York.—The following officers and directors have been elected for the ensuing term: President, C. C. Roumage; Vice-President, Dr. J. H. Stebbins, Jr.; Recording Secretary, R. L. Bracklow; Corresponding Secretary, T. J. Burton; Treasurer, W. E. Johnson. Directors: Dr. J. T. Nagle, E. T. Birdsall, Albert Stetson, Louis T. Brush, C. W. Canfield, Harry Coutant, G. F. Basset, Frank M. Hale.

A True Story.—The scene is laid in the store of a Boston photographic supply house, the time being the early hour when the clerks have just arrived and are zealously on the alert, and when the store is partially filled with the conscientious representatives of the various paper manufacturers calling to see how "things are." Among the latter persuasion is the genial and diminutive demonstrator of the Callypso paper, descended from the noble family of the Rospigliosi, who gracefully approaches an intellectual looking clerk, engaged in doing up a package of a popular developer, and says in the purest Florentine accent: "Buon giorno, caro mio" (Good morning, my dear fellow). Quick comes the answer in faultless Italian pronounciation: "Eiko cum Hydro."

Lowell Camera Club.—At the annual meeting of this Club the following officers were elected:

Paul Butler, President; W. P. Atwood, Vice-President; F. T. Walsh, Vice-President; M. A. Taylor, Treasurer; G. A. Nelson, Secretary; A. H. Sanborn, Librarian; Charles Runels, Arthur Staples, Fay H. Martin, Directors; J. C. Wadleigh, Philip R. Hovey, John I. Coggeshall, William Corner, W. H. Dodge, Membership Committee.

It was voted to enlarge the club library which is kept at the rooms of A. H. Sanborn & Co., Central Block. A committee was appointed to take charge of an exhibition of amateur photographic work to be held in the fall or winter. It is proposed to have this exhibition open to amateurs outside of the club as well as to members. Prizes will be offered for excellence for work done during the present year.

The recent eclipse was viewed at the Northwestern University Observatory, in Evanston, by Director Geo. Hough, Professor B. C. Annis and others. The moon entered the penumbra at 7.30. The first contact, that is when the limb or outer edge of the moon entered the shadow, took place at 7.45. By the time the moon was in half eclipse, the sky about the moon was clear from even the trace of clouds, and Professor Hough photographed the lunar disk in partial eclipse. He later secured six photographs at various points of contact. The total eclipse took place at 8.52. The third contact, when the moon began to emerge, was at 10.27, and the fourth contact occurred at 11.25.

After the first half-hour the sky was remarkably clear and the moon presented a beautiful picture of delicate colors, varying from light yellow or golden to dark red copper color The eclipse was a most satisfactory one to those interested in astronomy.

Capital Camera Club.—An exhibition of photographic prints, under the auspices of the Capital Camera Club, will be held in the rooms of the Cosmos Club, in this city, opening on the 14th of May, 1895. The exhibition is intended to cover a new work. All classes of photographic work will be represented, and medals and certificates will be awarded to the best in each class. Special prizes for general excellence will also be offered. Only amateurs will be permitted to enter prints for competition. Prints which have already been exhibited in any exhibition in Washington, where prizes were awarded, will be excluded, and all prints that have received a prize elsewhere in a public exhibition will not be admitted in competition. Prints should be mounted on mounts not less than 8 x 10 inches; several small prints may be put on one mount. Frames (without glass) are optional, but unframed prints are preferable. These should be in the hands of the Committee, for the purpose of being passed upon, catalogued, etc., etc., on or before the 1st day of May. Due notice will be given of the place where prints may be sent. In the meantime, intending exhibitors will please notify the Committee of the number of prints they intend to exhibit—not exceeding twenty—and gummed labels may be obtained for the same at the office of Mr. Chas. L. Dubois, 631 F Street.

Messrs. H. E. Miller, R. N. Brooke, and Chas. Parker have kindly consented to act as judges of awards.

Choosing Placeholders by Photograph.—Photography has been applied to many new uses of late, says the *Chicago Daily Tribune*, but the strangest application of all is an attachment to petitions for offices. Of late years the commercial traveler selling hardware, furniture and similar heavy "lines" has made up for the lack of samples by using photographs, and the practice of selling goods reproduced by the camera has become common and profitable.

Recently Congressmen and others urging the claims of applicants for office have been met with frequent questions from heads of departments as to the personal appearance of candidates. Several secretaries and bureau chiefs have repeatedly said they cared more for one view of a man's face than for a trunkful of endorsements. The clever office seekers have at last tumbled to the racket of sending their photographs with their regular papers, and the result has been in every way satisfactory. Men who have offices to give out like to make as good a showing as possible, and hence feel they know something of a man when they see his photograph. They say many of the worst appointments made in the civil service are not properly chargeable to them because they have only papers to consider, and these are, of course, uniformly favorable. It is seldom any formal charges or unfavorable comment against an unfit applicant for office are filed, and hence they look upon the photograph idea as a step in the right direction, as it enables them to get a vague idea of the personality of the applicant.

Candidates may not be satisfied with photographs, and one bureau chief expressed the opinion that phrenological charts would be the next fad in official papers.

The Great International Prize Competition and Summer Photographic Exhibition, to be held at the Agricultural Hall, from June 29th to July 6th next, is now fairly launched. There will be two distinct competitions, one under the Conference rules, with H. Horsley Hinton, Rev. F. C. Lambert, and H. P. Robinson as judges (whose names will appear on the prospectus), in which the classes are as follows:

1. Landscape.
2. Seascape.
3. Hand-Camera Work.
4. Figure Studies and Genre.
5. Beginners.
6. Ladies' Work.
7. Animal Study.
8. Smoking Picture.
9. Architecture.
10. Scientific Work.
11. Instantaneous and Snap Shot.
12. Process Work.
13. Society Competition.

Gold, silver and bronze medals are offered in classes 1 to 4, and silver and bronze medals in classes 5 to 12. The prize for class 13 is an optical lantern. The judging in classes 1 to 8 and No. 13 will be from the artistic standpoint; in classes 9 to 12 other matters will be taken into consideration, The prints *need not be framed*, and the entrance fee is 1s. per print up to a mount or frame of 20 inches; above that 2s. per print.

The second series of competitions are for amateurs only, who have not previously gained medals or prizes at a photographic exhibition. The judges' names will be announced later. The classes in this are:

Landscape.
Architecture and Buildings.
Marine.
Holiday Work (set of 6).
Portraiture.
Snap-shots (set of 6).
Frost and Ice Studies (set of 4).

In this competition the winning pictures (and perhaps a selection from the others) only will be hung. Silver and bronze medals, and various hand cameras are offered by some of the manufacturers. The entry fees and most other details are the same as for the other competitions. A somewhat novel feature of the exhibition generally is the fact that *Black and White*, one of the most artistic of English weeklies, will publish a special eight-page supplement with their issue of June 29th, illustrated by reproductions of some of the prize pictures, and paying for them at the rate of half a guinea to two guineas, according to the size of reproduction. The exhibition is being well received upon the Continent. Work is expected from Australia, New Zealand, South Africa, Japan, America, India, etc., as well as the Continent generally. Prospectuses, etc., may be obtained from the editor of this magazine.

The Boston Camera Club held their seventh annual Competitive Exhibition, for members only, at their rooms, No. 50 Bromfield Street, Boston, Mass., from April 3d to 20th inclusive. The collection comprised one hundred and eighty pictures, mostly unframed, contributed by thirty-five members, and was, on the whole, creditable to the reputation of the club. Among the printing papers, platinotype predominated, followed by plain salted paper, the other kinds being scarcely represented. Viewed individually, the work showed little improvement over that of recent years, especially over the pictures shown in the last joint exhibition of the New York, Philadelphia and Boston Camera Clubs, and, for some reason, such excellent workmen as Messrs. W. S. Briggs, Geo. H. Eaton, D. W. Lewis, Geo. Morgan and C. H. Currier were not represented at all, while the work of several members of conspicuous ability was far below their well-known standard. Owing to the large number of entries the limited wall space restricted the selection of the pictures for hanging to only the best work of each exhibitor; a number of pictures, of nearly equal merit, being necessarily excluded. This selection was left entirely to the discretion of the judges, who, in making the awards, based their decision upon the entire exhibits entered in competition. As the pictures submitted bore no mark suggestive of the contributor's identity, neither the committee in charge, nor the judges, were able to show any partiality whatever, and the verdict rendered was strictly free of bias, probably the most pleasant feature of the entire exhibition. Among the most notable exhibits was that of Mrs. Arthur Sewall, of Bath, Me, whose work, both in character and quality, resembles that of Mr. Stieglitz, of New York, and was awarded the honors for general excellence. Mr. J. P. Loud showed four landscapes, of which, "A Gathering Storm," in the opinion of the judges, displayed the most artistic sentiment, although "A Wintry Landscape" was equally good and also a superior composition. The winter landscapes of Mr. W. G. Preston were capital. The genre studies of Mr. Arthur M. Boos showed beautiful feeling, and in that respect were second to none in the collection. Mr. Geo. H. Chickering surpassed all his previous efforts in the thoroughly artistic treatment of natural scenery. The carbon enlargements of several of Mr. Latimer's famous marines were remarkably fine, and in beauty excelled anything of the kind ever shown in Boston. Five landscapes by Mr. Wilfred A. French were equal to this gentleman's well-known standard and won for him the prize for technical excellence. The landscapes of Mr. Chas. Sprague were capital and were generally admired.

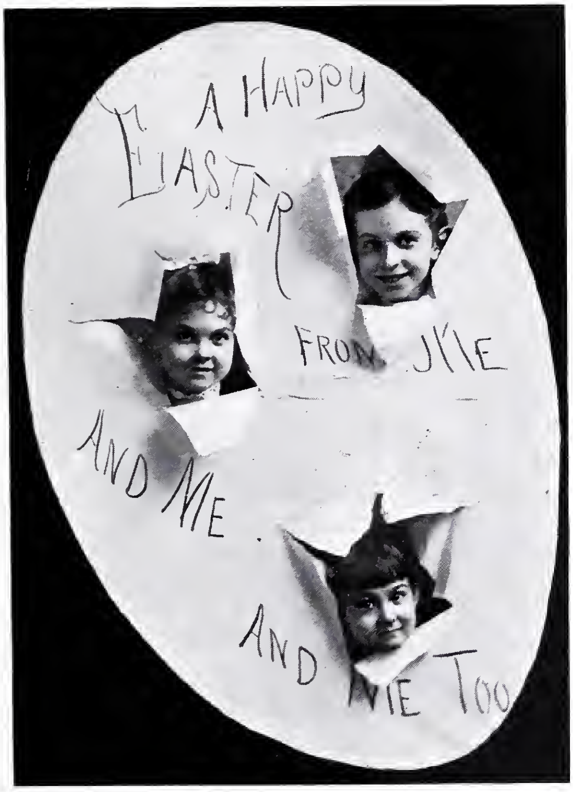
The judges' awards were as follows: Exhibit for general excellence, to Mrs. Arthur Sewall; exhibit for technical excellence, to Mr. Wilfred A. French; photograph having the most artistic sentiment, to Mr J. P. Loud; best portrait, to Mr. C. E. Lord; best figure composition, to Mr. T. I. Chapman; best study in home-portraiture, to Dr. and Mrs. O W. Huntington. Special Mention.—For picture entitled "Evening," to Mr. O. A. Eames; and for genre study, "In an Attic," to Mr. and Mrs. O. W. Huntington. The judges were Mr. William H. Downes, professional art-critic, and Mr. D. B. Vickery, professional portrait-photographer.

Harry Platt.—The readers of The Photographic Times will regret to learn of the death of a devoted photographer, which occurred at Nantucket, March 9, 1895.

Our older subscribers will especially remember him, as in former years Mr. Platt was a frequent contributor to these columns. Latterly his health, which compelled him to reside on the Island of Nantucket, prevented him from doing very much work of any kind, and his name has therefore been seen less often in our pages.

Henry C. Platt, better known as Harry Platt, was born in Augusta, Ga., June 29, 1850. After finishing his education in the city of his birth, he came North and entered the supervisor architect's office in the city of Boston, Mass.

In the fall of 1877 he opened an artist's studio in Norfolk, Va., where crayon, India ink, oil and water color portraits were made with great satisfaction to his patrons. This field not being large enough, however, he removed to Washington, D. C , where he continued his studio for a number of years. His work was specially sought after by most of the diplomatic corps, prominent members of which were his personal patrons. On his card at this period he refers to Countess Lewenhaupt, Count Lippe Weissenfeld, Baron Ernst Von Mayr, Baron De Arinos, Sir Edward Thornton, K.C.B., Señor Don Francisco Barca, K.S.I.



By Harry Platt.

AN EASTER PICTURE.

His experimental work is photography which he later carried on to a great extent. was begun in 1876, and the results of his investigations were freely given for the benefit of the profession.

He invented many devices which were never patented, but which have been used in more or less modified forms by various manufacturers. The patent by which he is best known is the Falcon Shutter and Camera, and which is now for sale by his widow.

He did much original work also in flash-light photography, making an instantaneous flash-light photograph as early as 1879.

But his ill health necessitated his removing from Washington, and he was compelled to retire to the Island of Nantucket, though still clinging to his artistic work. He made photographs while there for the natives, the above cut, calculated to take with the public, giving an idea of the original style of his work. He also made a magnificent collection of the landscapes on the quaint little island. The reputation of Nantucket as a seaside resort was largely increased by his photographs. His collection included about 2,000 negatives.

Mr. Platt was a great lover of nature and a devoted student of the natural sciences. He was a writer of ability, contributing to various magazines, both literary and scientific, the result of his investigations and observations. He was, moreover, a high-minded gentleman, generous and genial.

A hint of his personal characteristics is to be found in the immediate cause of his death, which undoubtedly was the news of his father's sudden death, preceding his by only two weeks, for, in his physician's estimation, he was recovering from a recent operation when this news reached him. He leaves a widow and three children.

Photographers' Copyright League.—At an informal meeting held by a number of representative photographers of this city, March 14, 1895, it was unanimously decided to issue the following prospectus to the prominent members of our profession, submitting the plan proposed therein to their earliest consideration, and requesting their immediate reply to same, to Committee of proposed Photographers' Copyright League, 13 and 15 West 24th Street, New York City.

Art in photography is at last a generally acknowledged factor, and the productions of photographers have become the chief source of supply for the illustrations which fill newspapers and periodicals. Even the courts now recognize that fact, and extend the protection of the copyright law to all such photographs as are "artistic."

During the past ten years a vigorous battle has been waging between a few determined photographers on the one hand, and an indiscriminate host of lithographers and other pirates on the other. The latter had become so used to appropriating without leave whatever they saw was good and original in photographic publications, giving in return neither remuneration nor even credit, and the results to them were so profitable, that the efforts to break them of the pernicious habit was no easy matter. On the contrary, it developed rapiply into a serious and bitterly contested struggle.

Thus far, each photographer has done his fighting single-handed, and generally against large and powerful corporations. In spite of this, however, the result has been almost uniformly a complete victory for the photographer, decision after decision being rendered in his favor by the courts, though often only after years of burdensome and expensive litigation.

In view of these facts, and other reasons which follow, we deem it wise and expedient, at this time, to band our best men together, so that in future a united front will be opposed to infringers of all kinds. There have been many demands within the past few years for such a union, and we know of no question now rife in the fraternity in which a community of interests would be more desirable, mutual, and in every way advantageous to us all.

Our proposition is that an organization (to be known as the Photographers' Copyright League of America) be formed at once, and take upon itself, by means of an Advisory Committee to be elected annually, the prosecution of all infringers of the copyright works of any of its members, whenever a proper case for such prosecution is presented by him—that it defray all expenses of same; and that, in return, so as to make it self-supporting, a fair percentage of all recoveries so obtained be turned into the treasury of the organization, in addition to a moderate annual membership contribution just sufficient to cover its necessary running expenses.

In union we shall certainly find our greatest strength. We are confident that such a League, composed of the artistic photographers of the country, will raise the dignity of our profession, and will often alone be sufficient to discourage infringements and frighten off piracy—but there is also greater success and economy in the plan. All our litigation would naturally be placed in the hands of the most experienced counsel, to be employed by the League for stated periods, and the cost of same would therefore be much less than if it were carried on by each individual for himself.

One other point. On March 4th, last, a new copyright law was enacted which, though in some ways an improvement on the former one, is still very deficient. Our fair rights demand that legislation give us a law which will *really* protect us by *really* punishing unscrupulous infringers. Of course, the advantage of such a demand before Congress, being backed by a National organization (instead of by individuals) of so important a profession as ours, must be apparent to all.

All this will surely hasten the day when the product of our brains, safeguarded by the stamp of the government under which we live, will be respected and regarded as sacred, no less than any other property; and when it will be no longer stolen with impunity by the powerful and the unscrupulous.

NAPOLEON SARONY,
B. J. FALK,
JAMES L. BREESE,
CHARLES E. BOLLES,
GEO. G. ROCKWOOD,
Committee.

The Society of Amateurs of New York held their second annual members' exhibition of photographs from March 18th to 27th last. The number of pictures exhibited was small and the hanging committee was able to do its work tastefully and without receiving the usual complaints of skying and flooring. With so small a number of exhibits one naturally looked forward to seeing the choicest works of the most prominent members. It was a sad disappointment, however. The majority of the best workers of the club, the men and women who have made the society famous for artistic work, were, to use a worn-out phrase, conspicuous only by their absence. The reasons for this we will not enter into. By the time this magazine is published the directorship of the society will have undergone a complete change, and we hope for a very considerable improvement in the management of the club.

By far the best picture in the exhibition was a fine carbon print by Mr. Harry Coutant. There was little in the picture itself, but the treatment showed considerable skill and artistic taste. A medal was awarded to this exhibit.

Mr. J. W. McKecknie received a medal for a frame of very ordinary snap shots at the seaside. The photographer had evidently endeavored to improve the picture by retouching out some of the figures. The work was fairly well done considering the difficulty, but could be readily detected, and in some cases utterly ruined what little merit the picture possessed.

Considerable attention was attracted to a picture by Mr. E. Warrin, entitled "A Swiss Hayfield," not from any merit the picture possessed, but from the fact that it had been awarded a medal as the best picture in the genre class, and also the President's medal, which was required to be given to the best picture in the exhibition. Technically the picture was fair, but the posing of the figures and the general composition were by no means to be admired. The picture represented a scene in a Swiss hayfield. A woman with a blurred mass for a face is giving a drink to a fellow laborer, while another old farm hand is standing bolt upright in the act of "having his picture taken." All these figures are standing as straight as possible. A glaring white sky covering one-third of the photograph completes the ruin of what could in no way be considered a picture. We have seen some much better work by this exhibitor, and we feel sure no one will be more surprised than he himself at the action of the judges in awarding this photograph the highest honors of the exhibition.

Mr. Chas. Simpson's exhibit of lantern slides was deserving of the medal awarded.

Mr. Alfred Stern showed a very good collection of pictures although a trifle mixed in quality. The framing showed considerable artistic taste.

Messrs. Davis & Sandford's exhibit of carbon prints left nothing to be desired. The reproduction of the black and white drawings of Frederick Remington were especially fine. We are pleased to see the supremacy of the carbon process of printing over other methods is becoming more and more recognized in this country.

Mr. A. L. Simpson exhibited a well-executed bit of interior work for which he received a medal.

Dr. James H. Stebbins, Jr., exhibited two charming little sunset scenes. Mr. F. C. Beach presented two excellent examples of how not to photograph buildings. Mr. and Mrs. Cornelius Van Brunt exhibited a frame of excellent flower studies colored with a considerable amount of skill and artistic taste. Mr. Charles I. Berg was represented by some very fine figure studies, one of which was certainly deserving of some recognition by the judges, and Mr. D. Berger Young's work attracted considerable attention by reason of its softness and delicacy.

The exhibition was well attended, and it is greatly to be regretted that the collection of pictures was not one that could in any way be considered as representative of the work the members of the society are capable of doing.

If the exhibition serves no other purpose, it should be a lesson to those responsible, and one that they will do well to study carefully. They will then discover the fact that those men and women who have by their untiring energy mastered the technique of photography, and are able to make pictures instead of mere mechanical photographs, will not consent to exhibit their work at an exhibition controlled by men in whom they can place but little confidence (we mean this remark in a photographic sense only, of course), and judged by men who have absolutely no qualification for such a position.

THE · EDITORIAL · TABLE ·

Reviews of Books, Photographs, Apparatus, etc. Received

From Mr. T. L. Graves, of Oakland, Oregon, we have received a number of excellent photographs.

We have received from a friend and contributor—K. Ogawa, Tokio, Japan—two very interesting illustrative works on the Japanese and Chinese war. Each book is illustrated with twenty-five or more collotypes by Mr. Ogawa from photographs from nature. One book is devoted to the naval battle of Haiyang, Sept. 17, 1894, and the other is descriptive of the operations in and about Kinchow, Talienwan, Port Arthur.

"The Metaphysical Magazine."—The fourth number of this new monthly is fully up to the standard set in the first issue. The literary editor of one of the New York dailies in a recent criticism of this periodical said: "The first three numbers show that the editors understand what is news in thought. Each of the thirty papers so far published has been on a subject having contemporaneous human interest among people who think, and it has been written in each and every case by some one whose views carry weight. The thinking man who misses the reading of this magazine loses much." This applies with equal truth to the April number, which contains, among other articles, "The 'Wonders' of the Kabbalah," "The Physico-Astronomical Theology of Easter," "The Brain's Glebe," and "Educational Uses of Mental Suggestion." $2.50 a year; 25 cents a number. 503 Fifth Avenue, New York.

Instructions Pratiques pour produire des Epreuves irréproachables au point de vue technique et artistique. A. Mullin. Paris, 1895: Gauthier Villars et Fils.

The author of this little work endeavors to give in clear and precise language all that is necessary, practically and theoretically, to enable the amateur in a short time to produce perfect photographs. He indicates the rules of composition as required by various subjects and points out the part which the principles of esthetics play in contributing to the final result. The practical side, naturally the most elaborated, is treated on entirely new lines in this book.

Cadett Lightning Plates.—From Messrs. Cadett & Neall, of Ashtead, Surrey, England, we have received samples of their new "lightning" plates, which they claim to be faster than any other plate upon the English market. We have given them a trial, and are thoroughly convinced of the truth of the statement. Not only are they of extraordinary rapidity, but there is not the slightest trace of fog, and the image develops up with a clearness and brilliancy that we only expect to find in slow working plates. Each box is marked with the speed number as found by the Hurter and Duffield system, a method of testing that is gradually being adopted by all the English plate-makers.

Description et Usage d'un appareil Elémentaire de Photogrammetrie.—Par Le Commandant V. Legros. Paris, 1895: Société d'Editions Scientifiques.

In his *Eléments de Photogrammétrie*, M. Legros has shown that all the essential results of the photographic method of preparing plans instituted by Colonel Laussidat may, without any difficulty, be obtained with the aid of the ordinary photographic apparatus possessed by every amateur. In the present work he shows that it is possible, nevertheless, to abridge the work materially by making use of apparatus fitted with some simple and inexpensive attachments which may be adapted to any camera.

The elementary character of these attachments does not allow the application of the elaborate methods of the German surveyors with the aid of apparatus infinitely more complicated.

The author has had the good fortune to run across a method incomparably more simple, and mathematically more correct.

The value of the method and the apparatus necessary for its application is shown by the fact that the two first cameras so fitted were purchased by the government officials for use in the geographical service of the "Ivory Coast" and in Haut-Mekong

Williams' Ferro-Platinite Paper.—From Messrs. A. H. Sanborn & Co., of Lowell, Mass., we have received a sample of this new printing paper. The instructions for working it are given by the makers as follows:

Ferro-Platinite is not a printing-out paper, and on account of its great sensitiveness, which is about three times that of albumen paper, care should be taken in regard to exposing it to white light both before and after printing, and particularly during development.

Print in sunlight or diffused daylight until the details are faintly visible in the half-tones, being careful not to over-print.

Development is effected by immersing the print in either of the following developers:

DEVELOPER NO. 1.

Ammonium carbonate	1 ounce
Water	5 ounces

DEVELOPER NO. 2.

Ammonium carbonate	1 ounce
Bichromate potash	2 to 5 grains
Water	5 ounces

Developer No. 2 is especially recommended for colder tones.

The print will develop instantly, but should remain in the solution until the yellow coating is dissolved, leaving the high-lights clear, which will be in from three to five minutes; then wash in six or eight changes of water, or in running water for one-half hour. The prints are then ready to be mounted in the usual way, or dried between blotters.

The ammonium carbonate and bichromate potash, which can be procured of any druggist, will dissolve readiiy in cold water, if powdered first.

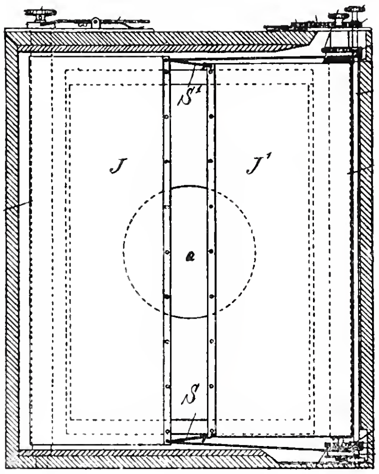
The developer can be used repeatedly as long as it gives good results. Use a generous quantity, and keep in a well stoppered bottle when not in use. Do not use metal dishes of any kind, or dishes that have been used to hold negative developers, or hypo solutions. Use only clean porcelain, glass or rubber dishes for this work.

With some kinds of negatives the results resemble platinotype prints. The paper gives a blue-black image on a mat surface.

PHOTOGRAPHIC PATENTS.

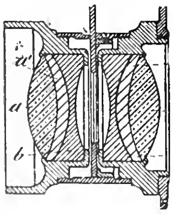
No. 535,850. Photographic Curtain Shutter.—Walter Oehemke, Berlin; assignor to C. P. Goerz, Schöneberg, Germany.

An invention relating to a device for operating the shutter of photographic cameras, and having for its object the provision of means whereby such shutter can be readily adjusted and instantaneously closed.



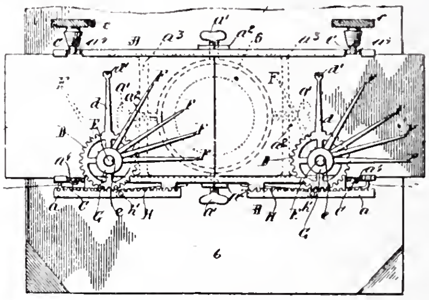
No. 535,897. Lens for Optical Purposes. Carl P. Goerz, Schöneberg, and Emil von Hoegh, Wilmersdorf, Germany.

A photographic objective consisting of two sets of lenses, each composed of two juxtaposited lenses of like name and a lens of unlike name combined with one of said lenses of like name, the juxtaposited lenses of like name having a greater and less refractive power respectively than the lens of unlike name, and the outer lenses having their outer surfaces curved in the same direction, for the purposes set forth.



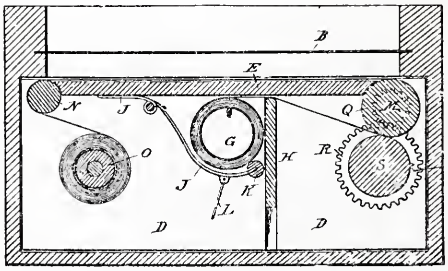
No. 536,105. Field-of-view-divider Shutter.—Edwin Stowell, Fairhaven, Mass.

This invention consists in a mechanism designed to divide the field of view of a camera objective into two or more parts, the object being to produce a photograph showing one complete unbroken view of a landscape or other immovable containing a picture of a movable object, animate or inanimate, in two or more attitudes or positions.



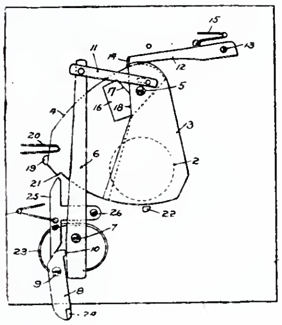
No. 536,178. Photographic Roll-Holder. Erastus B. Barker, Newark, N. J., assignor to E. & H. T. Anthony & Co., New York.

Claim is made for the combination in a roll-holder of a guide roller, driven by the adhesion of the film, and another roller provided with prick-points geared to said guide roller, so that the film will be punctured when an amount sufficient for a single exposure has gone over the guide roller, and an incline on the end of the puncturing roller, which automatically operates an indicator exposed at the outside of the roll-holder, for the purposes set forth.



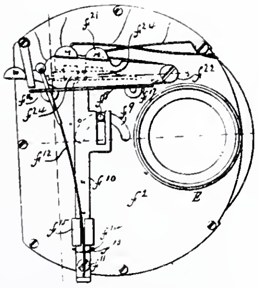
No. 536,242. Photographic Shutter. Abner G. Tisdell, Scranton, Pa.

In a camera shutter, a leading and a following wing, said following wing having a stop shoulder whereby it is caused to be moved by said leading wing after exposure; a pivoted actuating lever, connected to said leading wing at one end, a pivoted push lever adapted to make contact with the other end of said actuating lever, on either side of the fulcrum of said push lever, and a pivoted safety stop situated in the path of movement of the projection of said push lever, so as to be swung by reverse movement thereof into engagement with the shoulder on said following wing, substantially as described.



No. 536,253. Photographic Shutter. Washington I. Adams, Montclair, N. J., assignor to the Scovill & Adams Co., New York, N. Y.

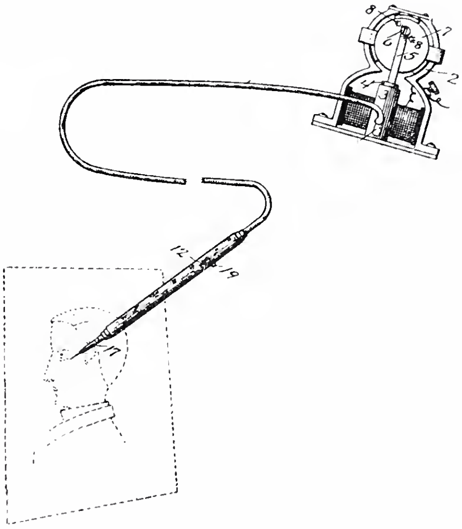
In a camera, the combination with a lens tube, of a shutter, a main lever for imparting motion to the shutter plate, a spring for actuating said lever, a stationary notched plate with which the spring may be engaged in either of two positions to cause the main lever to reverse the movement of the shutter and levers f^{20} f^{21} for holding the main lever until it is desired to operate the shutter, and the lever f_{19} for releasing said levers substantially as specified.



In a shutter mechanism for cameras, the combination, with a lens tube, of the pivoted shutter plate having a pin or projection, as f^{8}, the slotted lever, as f^{16}, engaging said pin, the spring, as f^{12}, adapted to be set so to move said slotted lever in either of two directions, the stationary plate, as f^{18}, having notches for holding said spring in either of two positions,—the levers, f^{20}, f^{21}, held by springs and having projections, as f^{24}, adapted to engage the free end of of the slotted lever, and to be separately released therefrom, and the lever f^{19}, for causing said levers f^{20}, f^{21}, to simultaneously release the slotted lever, substantially as and for the purposes set forth.

No. 536,291. Photographic Retoucher.—Arthur E. Peck, Minneapolis, Minn.

In a photographic retoucher, the combination with the barrel or handle of the piston and its attached rod reciprocable in the barrel, of means for adjustably limiting and controlling the length of reciprocation of the piston and its rod, said means consisting of a tapered hole formed in the piston rod and an adjustable screw passing through the barrel and entering said hole, substantially as and for the purposes described.



* * *

OUR QUARTERLY COMPETITION.

No. 6.—SCIENTIFIC.

For the best photograph illustrating some scientific subject we offer the following:

First Prize: A Silver Medal and Photographic Times Certificate of Merit.

Second Prize: A Bronze Medal and Photographic Times Certificate of Merit.

Third Prize: A Bronze Medal and Photographic Times Certificate of Merit.

Photographic Times Certificates will also be awarded to three other competitors, to be decided by the judges, if the work be sufficiently meritorious.

RULES.

Rule 1.—All entries must be forwarded to Editor Photographic Times, 423 Broome Street, New York, and marked "Competition."

Rule 2.—No indication of the competitor's identity to be placed on the competing pictures. A *nom de plume* (initials debarred) should be written on the back of the picture, and the coupon to be found upon one of the advertisement pages should be cut out and filled in with name and address, together with a few particulars regarding the photograph and any other details of interest, and inserted in a sealed envelope, upon the outside of which the *nom de plume* must be clearly repeated.

Rule 3.—The competition to be an open one. Any number of pictures may be sent, but each one must be accompanied by a coupon and a different *nom de plume* used in each case.

Rule 4.—All pictures for competition must be sent prepaid.

Rule 5.—In this competition the making of the negative only need be the work of the competitor.

Rule 6.—The prints must be mounted. Framing optional.

Notes.

All the rules given must be strictly adhered to or the competitor will be disqualified.

Absolute discretion will be placed in the hands of the judge or judges, but we reserve the right to adjudicate on any question outside the actual judging.

Awards will be withheld if the judges decide that the work is not sufficiently meritorious The possession of a Photographic Times Medal will, therefore, be a guarantee of a high order of merit.

The editor reserves the right of publishing reproductions of any of the photographs submitted.

No competitor shall receive more than one prize.

Pictures may be of any size or shape.

Any photographic process may be employed.

Pictures entered for competion will not be returnable.

The last day for receiving entries will be June 30. The awards will be announced as soon after as possible.

SPECIAL LANTERN-SLIDE COMPETITION.

For the best set of six lantern slides we offer one silver and one bronze medal in each of the following classes:

I. Landscapes.
II. Marine pictures.
III. Genre studies.
IV. Scientific subjects.
V. Architecture.
VI. Portraiture.

RULES.

Rule 1.—Entries may be made in any or all of the different classes, and must consist of six slides for each set entered, sent prepaid.

Rule 2.—Both the original negatives and the slides must be the entire work of the competitor.

Rule 3.—No competitor will receive more than one prize in any single class.

Rule 4.—The coupon to be found in the advertising pages must be filled up and sent with the slides.

Rule 5.—The size of the slides should be 3¼ x 4, or 3¼ x 3¼. When viewing the picture in its natural position the label containing the title must be to the right, and the thumb label on the lower left hand corner.

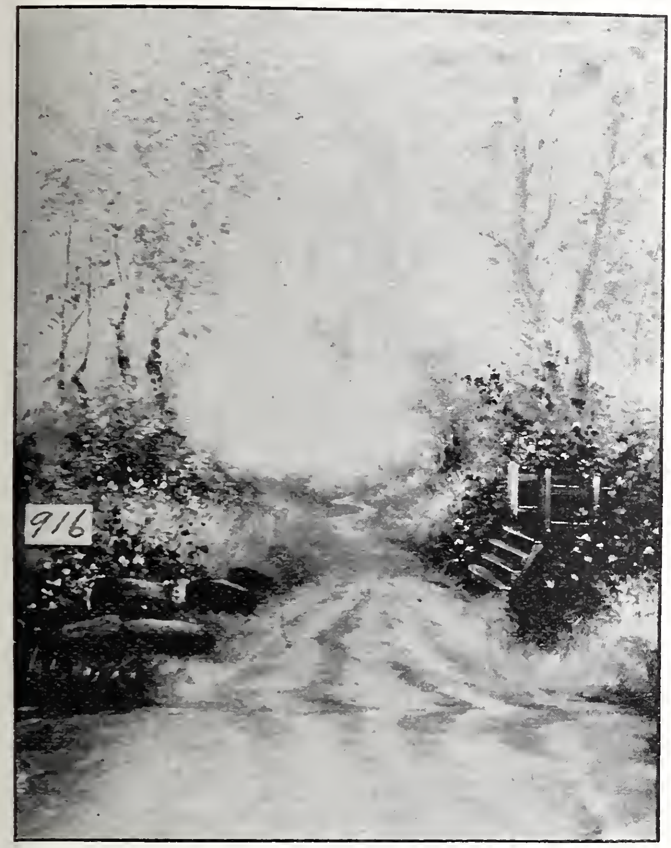
Rule 6.—Sets receiving the awards will become the property of The Photographic Times, and will be loaned to the principal photographic societies. The remainder will be returned at the expense of the competitors, *if so desired in writing*.

This competition will be closed on the 30th day of June, 1895.

$25 CASH PRIZE

will be given for the best description of the modern process of half-tone engraving by the enamel method. Articles must be sent to the Editor before the end of May, and should not be more than 4,000 words in length. The unsuccessful manuscripts will be returned if stamps be enclosed for that purpose. The prize will be given for the clearest and most practical article. Illustrations can be sent where necessary. Sketches or photographs will answer the purpose. Address, Editor The Photographic Times, 423 Broome St., New York City, N. Y.

Packard Bros.' New Grounds.



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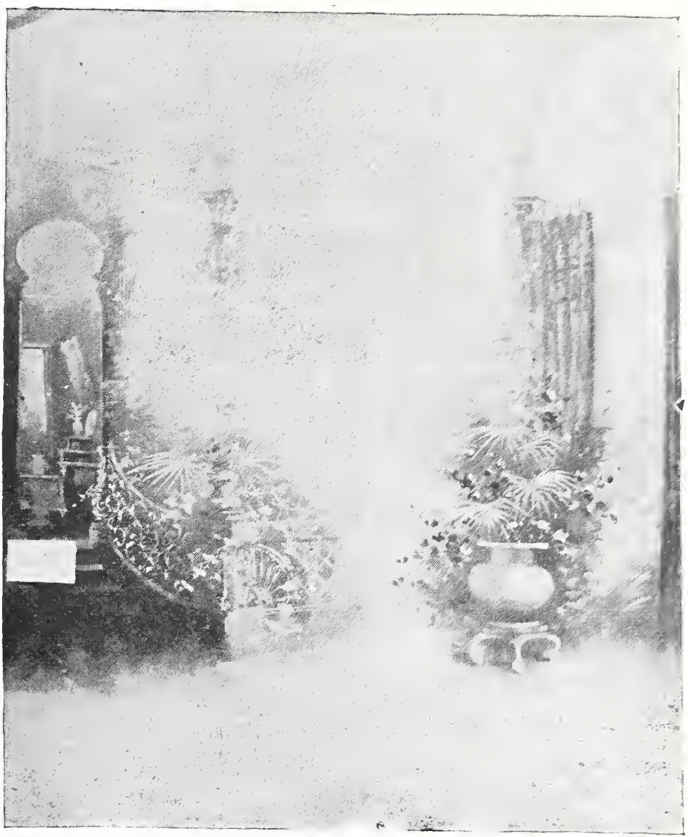

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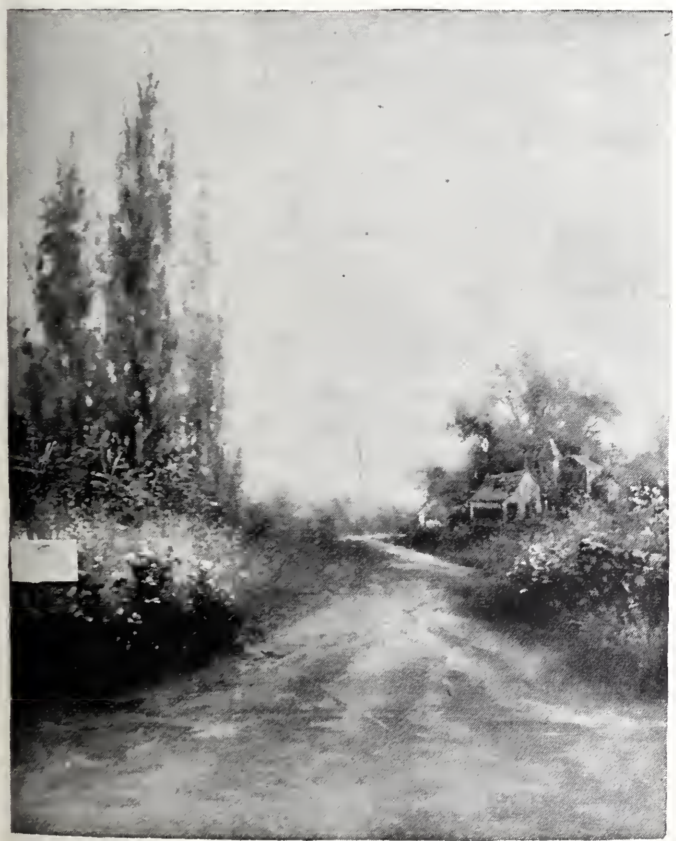

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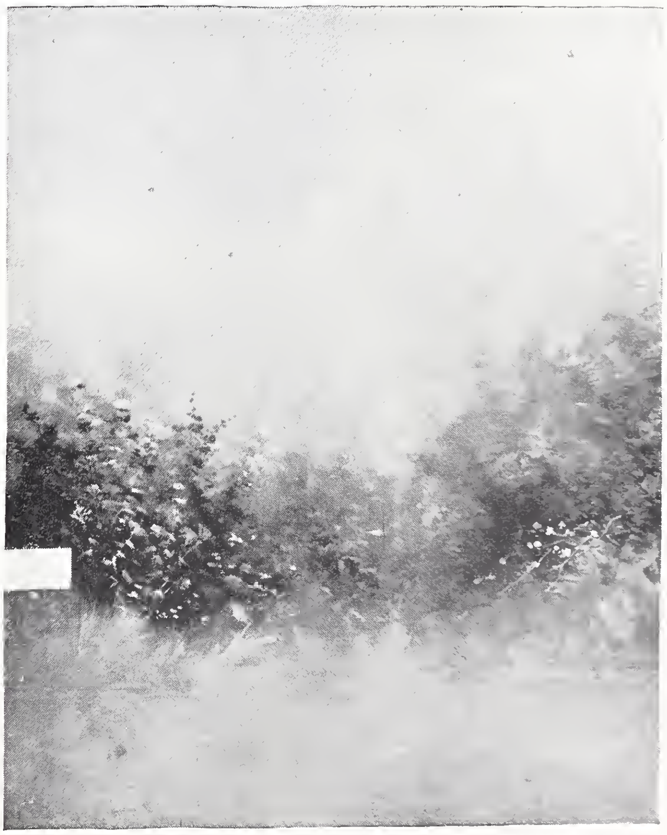


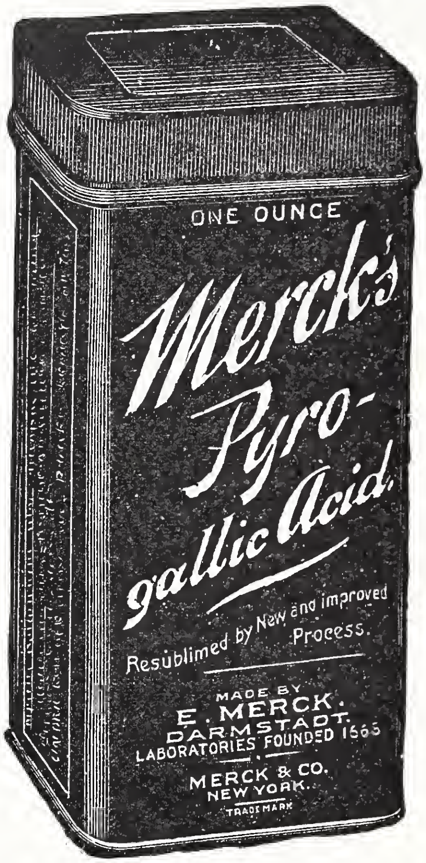
No. 922.

PRICES:

6x8	$6.00	6x8 with 6 foot extension floor cloth,	$8.00
8x8	8.00	8x8 with 6 foot extension floor cloth,	10.00
8x10	10.00	8x10 with 6 foot extension floor cloth,	12.00

FOR SALE BY THE SCOVILL & ADAMS COMPANY OF NEW YORK.

Merck's Pyrogallic Acid


ONE OUNCE
Merck's Pyro-gallic Acid.
Resublimed by New and improved Process.
MADE BY
E. MERCK.
DARMSTADT.
LABORATORIES FOUNDED 1668
MERCK & CO.
NEW YORK.
TRADE MARK

will be found, upon comparison, to be superior in every respect to all other brands on the market. Its distinctive points of superiority are:

1st.—ABSOLUTE PURITY

2d.—PERFECT CRYSTALLIZATION

3d.—IMMACULATE WHITENESS

4th.—EXTREME LIGHTNESS

5th.—MODERATE COST
(Its price is not higher than that of any other make.)

Merck's Pyrogallic Acid

produces the highest intensity to be desired in a photographic plate, and, at the same time, the finest detail in light and shade required for the most perfect printing negative.

Under ordinary precaution, it retains all its superior qualities undiminished for an indefinite length of time.

☞ WHEN ORDERING SPECIFY **"MERCK'S."**

TO BE HAD OF ALL DEALERS.

THE PHOTOGRAPHIC TIMES.

AN ILLUSTRATED MONTHLY MAGAZINE DEVOTED TO THE ART, SCIENCE AND ADVANCEMENT OF PHOTOGRAPHY.

Issued on the fifteenth of each month.

EDITED BY
WALTER E. WOODBURY.

SUBSCRIPTION RATES.

For one year	$4 00
" six months	2 00
Three months' trial	1 00

Single copy, 35 cents.

On Foreign Subscriptions $1.00 is added to pay postage.

Remit by Express Money Order, Draft, P. O. Order, or Registered Letter.

Subscriptions to THE PHOTOGRAPHIC TIMES received by all dealers in photographic materials in this and foreign countries, also by The American News Co. and all its branches.

ADVERTISING RATES WILL BE SENT ON APPLICATION.

Copy for advertisements must be received at office one week in advance of the day of publication. Advertisers receive a copy of the journal free, to certify the correctness of the insertion.

All literary contributions, correspondence, "Queries," etc., should be addressed to THE EDITOR; all advertising matter to the Publishers.

THE PHOTOGRAPHIC TIMES PUBLISHING ASSOCIATION,
W. I. LINCOLN ADAMS, MANAGER,
423 Broome Street, New York.
LONDON: JONATHAN FALLOWFIELD,
146 Charing Cross Road, W.

ITEMS OF INTEREST.

The Ilotype Paper received the grand prize at the Indiana State Convention of Photographers. The merits of this paper are being more widely recognized every day.

The Record, Harvard and Crescent Plates, all made by the New York Dry Plate Company, are making good headway in popular estimation.

The Record plate is extremely rapid; the Harvard brand is rapid, and the Crescent is slower.

These plates are made at a new factory at Guttenberg, on the Hudson, with all the latest appliances and conveniences for turning out plates of a uniformly fine quality.

Metol.—We have just been informed by the manufacturers of Metol-Hauff, Messrs. J. Hauff Chemical Works, Feuerbach, Wuertenberg, Germany, that after exhaustive experiments and large outlays for apparatus they have succeeded in further increasing the purity and strength of Metol-Hauff so that it will be from this time on chemically pure and of greater strength than ever.

The Henry Clay Cameras have long been acknowledged by all to be standard. The price of the regular Henry Clay and Stereoscopic, however, of necessity, puts it beyond the reach of many. The Heny Clay, Jr., while retaining the superior workmanship of the regular Henry Clay, by having a less expensive lens, comes within the reach of a larger circle of amateurs. But still there is a demand for even a cheaper Henry Clay, and consequently the little Henry Clay, 2d, has sprung into immediate popularity. With its three double dry-plate holders, excellent lens and safety shutter, rising and swing front, reversible view finder and fine finish, it is very big value for $15. A complete circular of description will be sent to any one on application.

The Blair Camera Co. announces several new cameras for the season of '95, as will be seen in their advertisement on another page. They are the 4 x 5 Folding Hawkeye, 4 x 5 Regular Hawkeye, '95, and the Hawkeye, Jr. An illustrated catalogue, giving full description and price-list of these and other cameras, may be obtained by addressing The Blair Camera Co., 471 Tremont Street, Boston.

Ilo at the Convention.—It is very gratifying to us to be able to record the well-merited compliment Ilo paper received at the recent Convention held in Indianapolis. Mr. F. R. Barrows, of Fort Wayne, who made his exhibit on this paper, was awarded the grand prize, while the Ilotype Company wins a prestige the value of which cannot be overestimated. We have noted with interest the steady advance in popularity that Ilo has made, and with such a record as this Ilo paper now takes the lead over all others.

The new "Three Shields" Plate ("swift as light") is making rapid strides in popular favor. Briefly, its points of superiority are, extreme rapidity; ease of manipulation, both in the developing tray and in the fixing bath (it fixes from three to six times quicker than any other brand on the market); freedom from frilling or blistering and fine printing qualities. This plate is made by the latest and most approved methods. It is uniform and reliable, and is indispensable for quick studio and "snap shot" work. The name *Three Shields* is a sufficient guarantee of its excellence. Ask yoar dealer for the "Three Shields" plate.

Extract from the "Sketch," London, Eng.—"Mrs. Ward, as Miss Catherine Weed Barnes was perhaps better known by her writing than by her camera work. She was for two years responsible editor of the *American Amateur of Photography*, as well as a frequent contributor to photographic journals. She is at present, as our readers are well aware, associate editor of the *Photogram.* She built at her home in Albany, N. Y., two studios for the careful study of portraiture, in particular figure studies to illustrate well known poems; her most important series being in illustratlon of Tennyson's "Enoch Arden" and "Elaine," in the preparation of both of which she was greatly assisted by L. W. Seavey, the leading American painter of backgrounds and accessories."

The Hammer Dry Plate, which is now firmly established as a first-class plate, equal to the best on the market, may be obtained in any quantity or sizes, of the very latest emulsions, from The Scovill & Adams Company, who are the eastern trade agents for this high class plate.

The Hammer plate has made steady progress from the very first. It is probably more widely used by professionals throughout the eastern territory than any other brand of plate, which is saying a good deal for its qualities when it is remembered that the Hammer plate is one of the latest candidates for popular approval. Its progress has been almost phenomenal. Within a very few years it has reached a consumption which only one or two of the high first-class plates enjoy. It is extremely rapid, very uniform and absolutely clean. Those who have not already tried it should do so at once.

The Scovill & Adams Company have sent out the following announcement:

To Photographic Merchants:

We beg to notify our friends and the trade generally, that we have incorporated the New York department of our business under the name of "The Scovill & Adams Company of New York," in order to more readily comply with the laws of this State concerning corporations, and escape the discrimination against corporations of other States doing business in this.

A new, large consignment of Carl Zeiss Lenses has recently been received from the Carl Zeiss Optical Works, at Jena, Germany, by The Scovill & Adams Co., of New York, who are the trade agents for this most improved lens in America.

The lot includes some sets of the new Anastigmat lenses "which are the *best* photographic objectives on the market," as stated by a well-known authority. In Europe the greatest part of the business done in photographic lenses is in the hands of the Carl Zeiss Optical Works. This fact speaks for itself. In this country, also, we are informed, the Carl Zeiss lens is sold more largely at present than any other objective.

Coeln, March 11, 1895.

Ed. Wuestner, Esq.,
New Eagle Dry Plate Works, Jersey City, U. S.:

Dear Sir: I am more than pleased with the results obtained on your Ortho Non-Halation Plates. Not only do they entirely overcome halation, but also render perfect color values.

I send you by same mail a few sample prints made from your plates.

Very truly yours,
Theo. Creifelds.

Boston, Mass., Office Benj. French & Co.

Mr. Ed. Wuestner,
New Eagle D. P. Works:

Dear Sir: I consider your Imperial Non-Halation Plates superior to any. The work done on your plates by myself has given so much pleasure, or at least satisfaction, to so many persons throughout the country familiar with my pictures, that I have sent out a collection to the Winter Exhibition of the Societa Fotografica Italiana at Milan, where I received the only silver medal awarded.

Yours truly,
Wilfred A. French.

The Society of Amateur Photographers of New York.—Meeting Tuesday, April 9, 1895. Mr. F. C. Beach showed two 8 x 10 plates exposed and developed by him, one made with a Goerz Double Anastigmat of 9½-inch focus, and one made with a Voigtälnder Euryscope of 12½-inch focus. Although the Goerz lens had a 2-inch shorter focus, the plate showed a greater sharpness than the other made with the 11½-inch Euryscope. Mr. William Goerz, brother of C. P. Goerz and Manager of the N. Y. Office at 52 Union Square, East, circulated comparative tables showing the results of five different lenses and proving the great superiority of the Goerz Double Anastigmat. Mr. Goerz invites everybody to visit his office and see by means of a large test chart a proof of the above statement.

The Zeiss Lens.—"These objectives are far ahead of anything I have yet tried," writes E. Bierstadt.

"**The Swift Lens** is the best lens for portraits, I think, that ever came into this town," writes B. W. Kilburn, the World's Fair Stereoscopic Photographer, from his home at Littleton, N. H.

St. Louis, Feb. 28, 1895.

MR. W. P. BUCHANAN, Phila., Pa.

Dear Sir: I have again given your powder (Luxo) a thoroughly comparative trial and find it *way ahead* of the different powders with which I tried it. Blitz Pulver comes the nearest to it, but there is so much difference between the two in favor of Luxo, that when once fairly tried none other will be used.

Now to state the superior qualities as I find them in Luxo after a thorough and careful and withal unprejudicial trial, in comparison with other best powders on the market, I will say that Luxo gives *by far* the most brilliant light, the nearest resemblance to a flash of lightning, or strong electric light of anything I have ever seen, therefore requiring far less powder for the same subject. It gives less smoke and the little smoke it does make is not so stifling, nor does it produce such an irritation on the olfactory nerves as Blitz Pulver, and other powders. It is as quick in its operation as any, and far more so than most of them. The noise produced in exploding a considerable quantity at *one* time is, comparatively speaking, nothing. I therefore find Luxo all you claim for it, and in practice will use no other. In the use of Luxo, flash-light work is robbed of all its terrors, and renders it possible and practical to operate a studio, with no other source of light.

[Signed,] Very respectfully,
W. H. H. CLARK.

DIETZ RUBY LAMP For Dark-Room Use.
New Cons ruction
Don't Leak Light.
1½x3x6½ ins.
NO SMOKE.
Sold by Dealers.
We send you one, prepaid, for 75 CENTS.
Circular free.
R. E. DIETZ CO., N. Y.

PORTABLE ART STUDIOS. **ALL WOOD!**
Light, Substantial, Practical Business Buildings.
CASH OR ON TIME.
Send Stamp for Catalogue. PORTABLE HOUSE CO.,
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Amateur Photographers
say that **the Best Blue Print Paper** is our

FRENCH SATIN JUNIOR.
4x5 per gross, $1.00
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Does all that silver paper will. Unsurpassed for beautiful definition. Keeping qualities guaranteed for one year. Money returned if not satisfactory. **New Book on Blue Printing, Sample and Price List FREE.**
J. C. MILLEN, 921 Arch Street, PHILADELPHIA, PA.

Business Notices.

FOR PLATINUM EFFECTS, use the NEPERA PLATINOÏD-BROMIDE paper. Same price and manipulation as the Nepera Bromide Paper. For sale by
THE SCOVILL & ADAMS CO. OF N. Y.

WANTED—Copy of THE PHOTOGRAPHIC TIMES for July 20, 1894. Editor THE PHOTOGRAPHIC TIMES, 423 Broome Street, New York.

PORTRAIT ENLARGEMENTS FOR THE TRADE.—Photographers can save money by dealing with us.
N. L. STONE & SON,
56, 58 and 60 Market St., Potsdam, N. Y.

WANTED.—Bound or unbound copie of vol. 12 of THE PHOTOGRAPHIC TIMES. Please address, giving price, the Editor of this magazine.

FOR SALE—A high-grade 5 x 5 camera, rectilinear lens, burnisher, and complete outfit; will exchange for hand camera or sell at half price for cash.
C. W. SNYDER, Straits Corners, N. Y.

FOR SALE—Portable photo gallery in A1 condition, fully equipped for immediate use. Address T. S. C., care of PHOTOGRAPAIC TIMES, or
W. C. COLLINS, 628 Ocean Ave., Jersey City.

A COPY each of NEGATIVE MAKING, INSTRUCTION IN PHOTOGRAPHY, PHOTOGRAPHY WITH EMULSIONS, by Captain Abney, and a copy of THE ART AND PRACTICE OF SILVER PRINTING, by Captain Abney and H. P. Robinson. The London Edition, aggregating $2.00, will sell for $1.00, or will send by mail, postpaid, any one copy for 35 cents. Address,
L. A., care of THE PHOTOGRAPHIC TIMES.

PLACE YOUR ORDERS now for the PLATINOTYPE, by Capt. Abney, and the PHOTOGRAVURE PROCESS, by Henry R. Blaney. Both books in the press to be ready soon.
THE SCOVILL & ADAMS CO. OF N. Y.

WANTED, to buy, A No. 1 negatives; must be landscape or marine. Address, enclosing stamps, for full particulars,
ARTISTS' ASSOCIATION,
47 N. 13th St., Philadelphia, Pa.

"AMATEUR PHOTOGRAPHY," by W. I. Lincoln Adams, is "A Practical Guide for the Beginner." Illustrated. Paper covers, 50 cents; cloth bound, $1. The Second Edition is now ready.

NEGATIVE RETOUCHING done for the trade and for amateurs. First-class work at reasonable prices.
Address M. K. MOORE,
123 West 16th Street, N. Y.

A NUMBER OF FINE LENSES and Cameras for immediate sale at reasonable prices. Address
A. A. de B., care of M. HUBBE,
22 State Street, New York.

CHAS. R. STEVENS,
Pres't and Treas.

GEO. P. MACKIN,
Vice-Pres't and Sec'y.

CHICAGO PHOTO STOCK CO.,
Dealers in
Standard Photographic Apparatus and Supplies,
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PHOTOGRAPHS colored, printed on platino paper. Satisfaction guaranteed. For particulars address
2713 First Ave., South Minneapolis, Minn.

WE WILL PAINT YOUR PHOTOGRAPH in water colors, cabinet size, and mount same in handsome mat for 75 cents; in white and gold frame, $2.10; any 5 x 7 photo painted in water colors true to nature for $1.
ARTISTS' ASSOCIATION,
47 N. 13th St., Philadelphia, Pa.

WILLIS & CLEMENTS have a new Platinotype Paper. See page 13 of the advertising pages.

GRIT VARNISH.—The best retouching medium in the market; 6-ounce bottle, 40 cts.
THE SCOVILL & ADAMS CO. OF N. Y.

ANDRESEN'S PURE SULPHITE, for Amidol, Para amido-phenol, Rodinal, Eikonogen, or Pyro. Use only Andresen's *Pure* Sulphite of Soda.

S. P. C. EIKOQUINOL DEVELOPER.—This "ne plus ultra" developer for timed and instantaneous exposures, lantern slides and all other kinds of transparencies, photo-mechanical work and bromide paper prints is now in stock and for sale at 35 cents per bottle of 8 ounces. No other developer is now used by the members of Chautauqua School of Photography; no other has attained to equally fine results.
THE SCOVILL & ADAMS CO. OF N. Y.
423 Broome Street, New York.

FOR SALE—Photo-engraving business; half-tone and embossing plates, including photo studio; nice small place in city, good location, rent very low; this is no run-down gallery, no cutting-in prices; bargain; owner is going to Europe; if you mean business write to
G. BUEHLER, 1308 Columbia Ave., Phila., Pa.

PORTE-FEUILLE CARDS.

The cards for these Albums may be quickly and securely attached to the guards after the prints are mounted and burnished.

Price-list, including 25 sheets of Collins' best quality White Cards:

No. 2,	10x12 for 6½x 8½ Photographs	$2 00
" 3,	11x14 for 8 x10 "	2 25

Price-list, including 25 sheets of Collins' White Muslin-Back Cards:

No. 5,	10x12 for 6½x 8½ Photographs	$2 00
" 6,	11x14 for 8 x10 "	2 25

THE SCOVILL & ADAMS CO. OF N. Y.
423 Broome Street, New York.

Cameras

ALL STYLES AND PRICES.

The Henry Clay Series, 4 Styles.
The Waterbury Series, 3 Styles.

Send for descriptive manuals of both Series.

THE SCOVILL & ADAMS CO. OF NEW YORK,
423 BROOME STREET.

Send 35 cents for a copy of **The Photographic Times**, containing about 100 handsome illustrations.

Look Out For It!

NOW IN PREPARATION:

Moran's Bargain List No. 45.

EVERY ARTICLE IN IT WILL BE A DECIDED BARGAIN.

Send your Address.

R. H. MORAN,
396 Broome St., N. Y.

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A WONDERFUL DEVELOPER For the PROFESSIONAL and AMATEUR.

* * * * * I am making better portrait negatives now with this Developer (J. C. Tabloids) and your Ortho. 27 Plates than ever, and am more than pleased with Plates and Developer.

A. REISER, Easton, Md.

Each box contains 96 Tabloids, Price 75 cents, sufficient to develop six dozen or more of 5 x 7 Plates. A sample box sent on receipt of 10c.

MANUFACTURED BY **For Sale by all Dealers.**

JOHN CARBUTT,
Keystone Dry Plate and Film Works,
WAYNE JUNCTION, PHILADELPHIA.

THE ALBERTYPE COMPANY
PHOTO GELATINE PRINTERS
15 LAIGHT ST., NEW YORK.

VIEWS
MADE INTO SOUVENIRS.
Send for Samples and Edition Prices.

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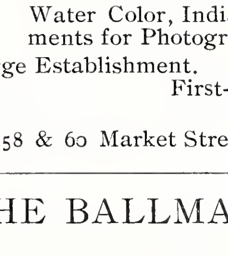

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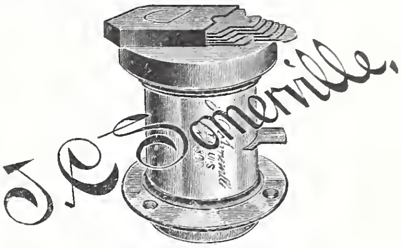

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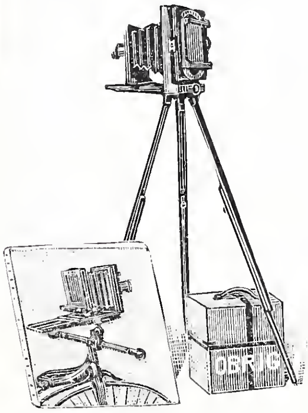

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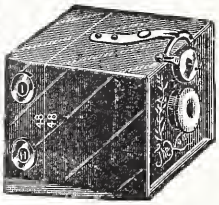

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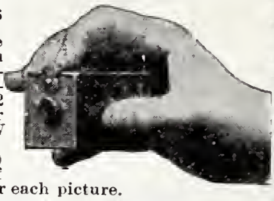

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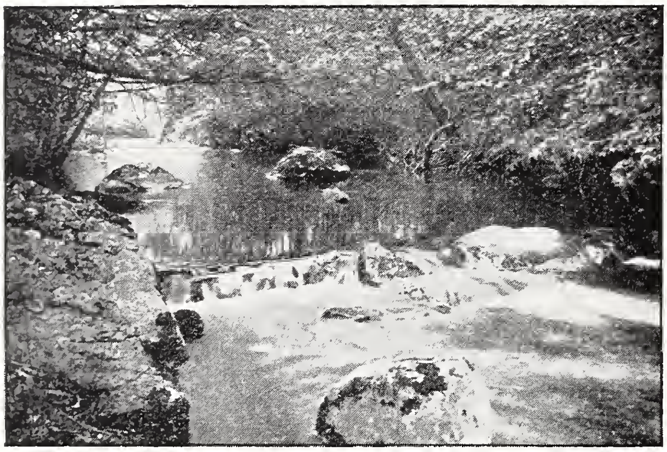

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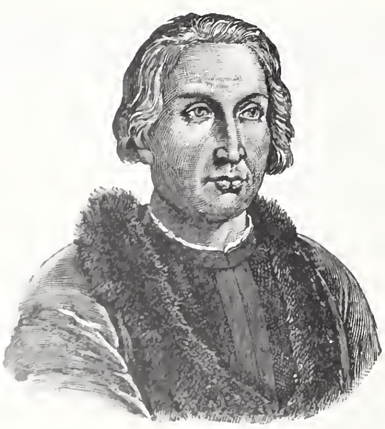

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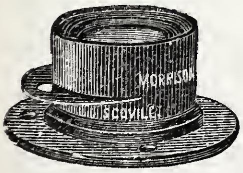

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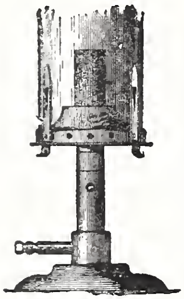

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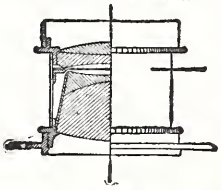

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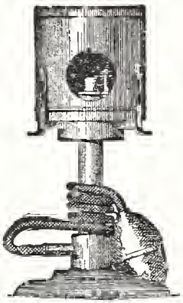

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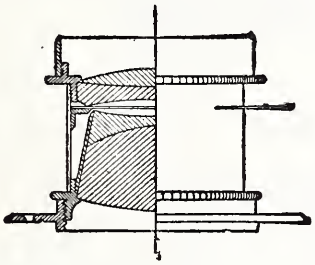

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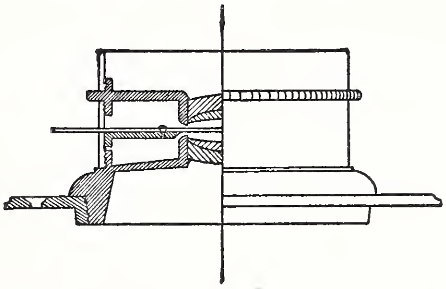

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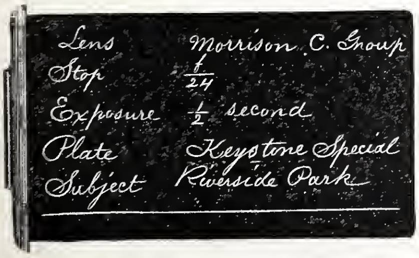

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A Gelatine Printing-Out Paper which does not Curl, Crack or Blister.

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3¼ x 4¼	$0 15	$1 50	5 x 7	$0 33	$3 50	8 x 10	$0 70	$8 00	3⅞ x 5½ Cabt. Trim.	$1 70
4 x 5	20	2 00	5 x 8	35	4 00	20 x 24	4 00	48 00	Cabinet 2ds	1 00
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Henry Clay 2d.

A 4 x 5 folding camera (second to none but the $55 Henry Clay). Price only $15. Pneumatic safety shutter, excellent lens, reversible view finder and three (3) double plate-holders.

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"Perfection" (Collodion) Paper.

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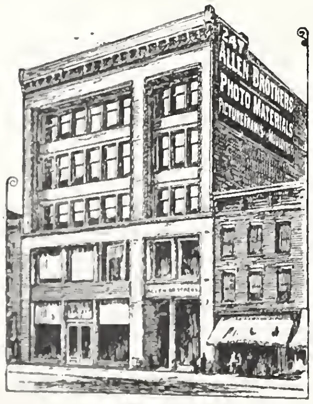

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New Waterbury Camera,

Containing (new) safety shutter, view finder, (new) focusing adjustment, three (3) double plate - holders. Leather covered. All for $15.

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Lenses are the Best.

TRY THEM BEFORE
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We invite comparison with any other make, at whatever price. Lenses sent for trial.

RAPID RECTILINEAR LENSES,

complete with shutter having "silent time" and adjustments for all degrees of speed, with pneumatic release, the workmanship of which we guarantee of the very best.

4 x 5,	6	inches focus	$13 00
5 x 7,	9	" "	15.00
6½ x 8½,	10.5	" "	25.00
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After many years of scientific research a preparation for the salting of plain photographic paper has been discovered, by which method the finest printing results are obtainable. The advantages are apparent to all.

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Sample Sheets, by mail, 10 cents each.

JUST PERFECTED.

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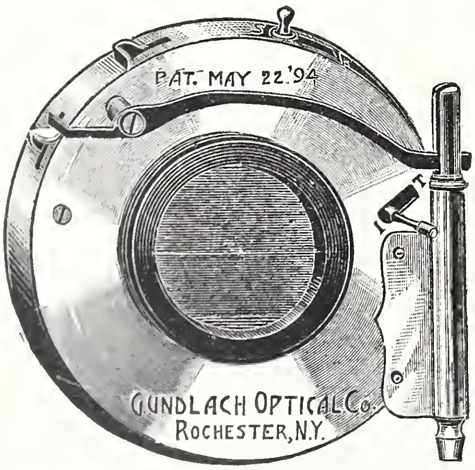
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Is the only **FIRST-CLASS** instrument of its kind, for these reasons: It combines correct optical construction with the range of exposure expected in a first-class shutter, *i.e.*,

Time, Slow-Instantaneous,

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A NEW RELEASE,
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These are the changes, giving the Triplex Improved its name.

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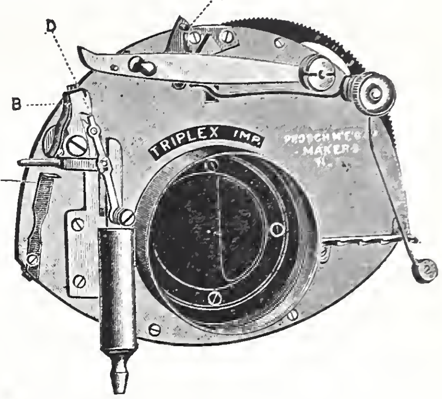

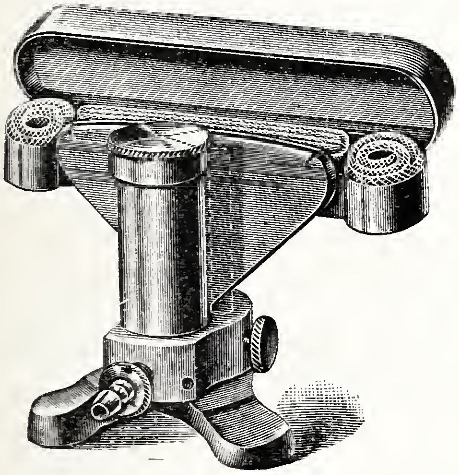

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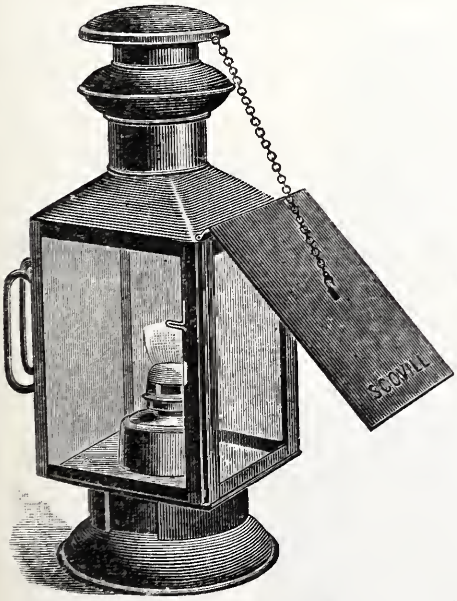

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Such is the reports of experts who have had them in use for months.

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BECAUSE it is constructed so that white light does not escape.

BECAUSE it gives ample light for the dark-room.

BECAUSE the abundant light does not fog, but does show any spot or blemish in the plate.

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BECAUSE it may be used either with coal oil or candle.

BECAUSE the flame may be so quickly controlled by unlatching the door or uncatching the bottom of the Lantern.

PRICE, $2.50.

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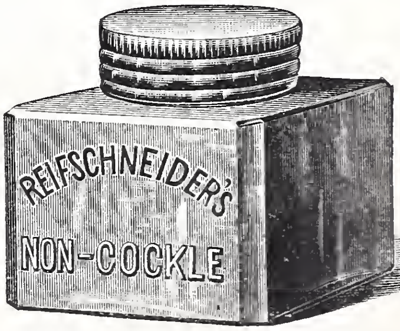
FOR MOUNTING PRINTS.



40 Cents per Bottle.

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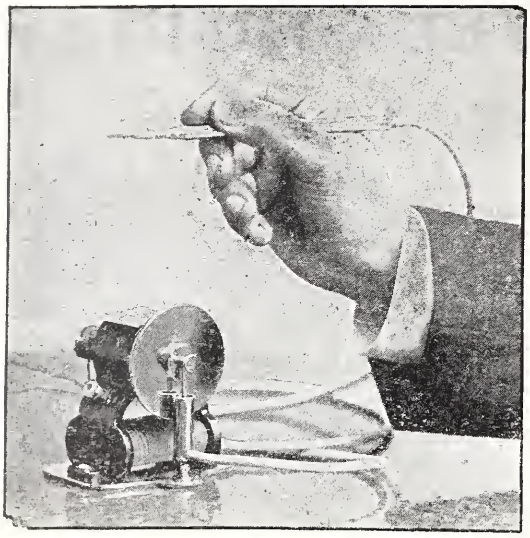

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AS A DEVICE FOR ASSISTING THE RETOUCHER, HAS NO EQUAL.

IT IS A NECESSITY IN EVERY GALLERY IN THE LAND.

It will treble your out-put.
It will treble your income.
It will improve your work.

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TRY THEM. FOR SALE BY ALL DEALERS.

The result justifies the expense.

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buys a Henry Clay Camera, and you get a $55 result in every picture.

Our Henry Clay Manual tells all about it. Free.

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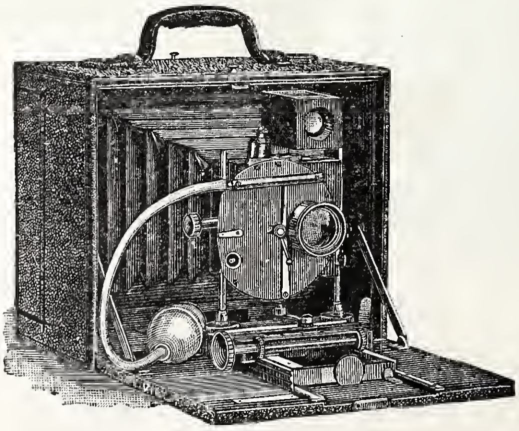

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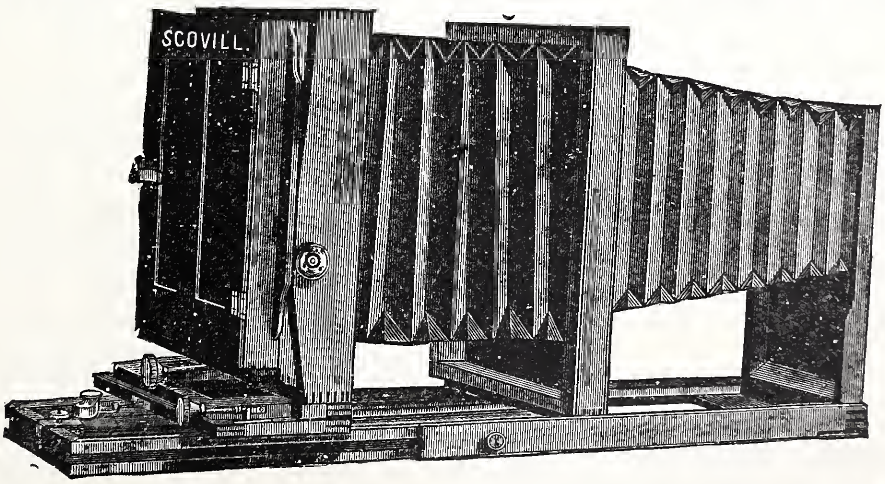

The American Optical Company Portrait Cameras are manufactured from the best mahogany, French polished, and have double bellows, vertical shifting front, the V-shaped wooden guide, telescopic platform, and Lever Focusing Attachment, by which the most delicate focus can be adjusted with the utmost facility and ease.

No.	Size.		With Double Swing-back.
5	8x10 ins.,	with platform 30 in. long	$38 00
6	10x12 "	" " 36 "	48 00
7	11x14 "	extension " 48 " and vertical shifting front	64 00
8	12x15 "	" " 48 " do	72 00
9	14x17 "	" " 60 " do	76 00
10	16x20 "	" " 65 " do	88 00

No.	Size.		With Double Swing-back.
11	17x20 ins.,	extension platform 65 in. long and vertical shifting front	90 00
12	18x22 "	" " 70 " do	100 00
13	20x24 "	" " 72 " do	110 00
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EVERYTHING FOR THE CAMERA.

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NEW ROSS-GOERZ LENS?

American Agent for **Ross Lenses.**

ROSS Portrait and View Lenses.
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All Brands of : : :
DRY PLATES, PURE CHEMICALS AND SUPPLIES of all kinds.

ALL THE LATEST HAND AND TRIPOD CAMERAS.

Descriptive Catalogues of any of the above sent on receipt of five cent stamp for postage.

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ABSOLUTELY PURE.

We have at last obtained a Photo Blotting Paper (The Albion) which is absolutely chemically pure. It is a very different article from ordinary blotting paper, which always contains more or less impurities that are injurious to photographic prints. This paper may be used in the most delicate photographic operations with perfect safety. We had it especially made for photographers' purposes, and can unhesitatingly recommend it.

Price per Half Ream, -	**$12 00**
" " Dozen Sheets, -	**72**

ASK YOUR DEALER FOR

Albion (100 lb.) Photo Blotting Paper.

The Scovill & Adams Co. of N. Y.,
SOLE IMPORTERS.

Felt Backgrounds.

The Scovill & Adams' Plain Felt Background, recently introduced, is a great boon to all Photographers, both Professional and Amateur.

It is made of strong, thick and even stock, and is of an agreeable neutral drab color. It is especially suitable for vignetting. The texture of the cloth absorbs instead of reflecting light, and thus produces soft effects, and agreeable depth in print. The liability of defacement by water stains is obviated.

The prices of these grounds are as follows:

4 x 6 feet	$2.50
5 x 6 "	2.75
6 x 6 "	3.00
6 x 7 "	3.50
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These sizes may be sent by mail on receipt of 35c. extra.

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That CARBUTT'S FILMS are Used the World Over,

Read the following letter from W. H. Jackson, Photographer to the Commission World's Transportation.

And for results see the Illustrations appearing in Harper's Weekly,

COMMISSION WORLD'S TRANSPORTATION,
Field Columbian Museum,
(J. G. PANGBORN, PRESIDENT.)

Calcutta, March 5th, 1895.

My Dear Mr. Carbutt:

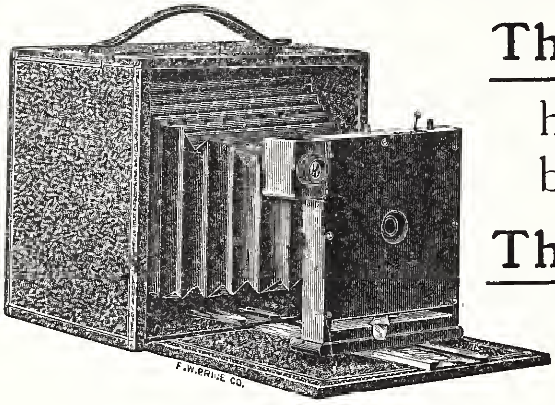
The last consignment of 100 doz. 8½ x 6½ Films arrived on the 26th inst., and I find them in fine order. While in Calcutta I developed the last film of the first consignment, and they have worked splendidly, the last as good as the first. I have developed en route as opportunity offered, in steamer cabins with the temperature above 100 degrees, in railway carriage closets, in hotel bed-rooms, the temperature of air and water seeming to have but little effect so far as facility in working was concerned. Here in India, from Ceylon to the snows of the Himalayas, they have all worked alike. A still harder test will come with our experience in the straits under the equator, but, from our past experience, I do not fear the outcome. The J. C. Developing Tabloids are all that I could wish, and are certainly a very convenient, as well as a most efficient developing agent. In regard to the next supply of films, it is a little early to say when we want it, but it will probably be Japan about June 1st. In conclusion let me thank you for the good work I have got on your films.

Yours truly,

W. H. JACKSON.

New Cameras for Season of '95

The 4x5 Folding Hawk-Eye, small in dimensions, neat in appearance, with a double swing and sliding front.



The 4x5 Regular Hawk-Eye, '95,

has many New Improvements never before introduced.

The Hawk-Eye, Jr.,

size of picture, 3½ inches square, is just the thing for the traveler.

The above mentioned Cameras can be used with both roll film and dry plates, and when used with the former **are loaded and unloaded in broad daylight.**

Send for illustrated Catalogue, giving full description and price-list of all kinds of cameras and accessories.

THE BLAIR CAMERA CO., M'f'rs, 471 Tremont St., Boston, Mass.

NOW IS THE TIME FOR FLASH-LIGHT WORK.

AND YOU WANT A GOOD MACHINE.

The Hunter Flash-Light Machine

IS THE BEST.

We have in this machine an apparatus specially arranged for the distribution of the light all over a large surface, and the system employed in igniting the powder is such that the greatest illuminating power possible is obtained from a given quantity of powder. As a matter of fact, this is over twenty times greater than the luminosity that would be obtained by burning the powder in a mass.

The advantages of this machine are that it can be taken apart or put together in less than three minutes. The tripod, although the lightest made, is the most rigid when set up, and can be raised higher and dropped lower than any other machine.

The principle employed is simple and practicable, consequently it is not liable to get out of order or fail when using.

The powder is thrown into the flame by the stroke of the hammer under the pan which separates and spreads the powder over a large surface, and so giving a far more brilliant light than would be obtained by the usual method of throwing the powder in the flame; as the powder being separated burns much quicker and the combustion is more perfect, not a grain of powder can escape ignition.

Where gas cannot be conveniently used the inventors recommend an alcohol machine devised by them. It is a very simple arrangement, and certainly to be preferred to the dangerous gasolin

Send for circular giving complete description and directions.

PRICE, - - - - - - Only $45

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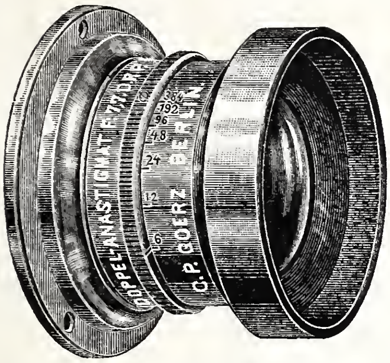
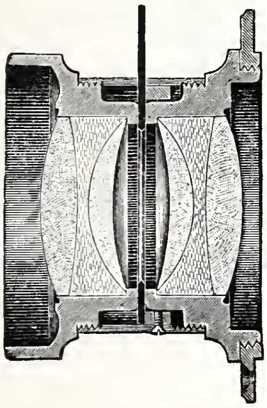


German Patent No. 74,437.
American Patent No. 528,155.



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Possessing wonderful marginal definition and depth of focus. . . . .

Series III. F : 7.7 (angle 70-90°), universal extra-rapid lens, for portraits, groups, instantaneous photographs, landscapes, architecture, interiors and enlargements.

Series IV. F : 11 (angle 75-over 90°), rapid copying lens, for full-size reproductions, enlargements, large groups, landscapes, instantaneous photographs, interiors.

Price List and information given, free of charge, on application.

For sale by all dealers, or **C. P. GOERZ,**

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British Journal, 1893, No. 1728.
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Satisfies those who want the BEST.

For they are the standard of . . . .

Excellency, Rapidity and Uniformity.

To-day are even better than ever.

INCOMPARABLE for the Studio.
for Landscape Photography.
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A PLATE

that has maintained the lead for years, by being the most reliable, the most Rapid, having the best printing qualities, and being easy to work, will prove to be

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If you are looking to your own interest, you will

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CRAMER'S PLATES.

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THE LATEST PRODUCTION OF

THE STANDARD DRY PLATE CO.

THEY ARE WORTHY YOUR TRIAL, FOR THEY ARE QUICK, CLEAN AND BRILLIANT, AND POSSESS THE VERY FINEST PRINTING QUALITIES.

THE PRICE, TOO, IS RIGHT.

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HAVE U TRIED

The Cramer Isochromatics?

IF not, WHY not?

They are the only plates on the market giving the full ISOCHROMATIC EFFECT without the use of a color screen.

Write for Descriptive Catalogue to

G. CRAMER, DRY PLATE WORKS,
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THREE SHIELDS

LIGHTNING PLATE.

SWIFT AS LIGHT.

For Studio, Snap Shot, and other Extremely Rapid Work.

WARRANTED PERFECT, CLEAN, CLEAR AND BRILLIANT.

FOR SALE BY ALL DEALERS.

A Word to the Wise is—

THEN READ THIS—

The People's Bank of Monroe,
Monroe, N. C., March 13, 1895.

Walpole Chemical Co.,
Walpole, Mass.

Gentlemen :

Please send me your Book on "Hypo," also retail prices for "Hypo," Acid Sulphite Soda, Acetate Lead, Acetate Soda, Carbonate Soda, Alum Chrome, Carbonate Potash and Oxalate Potash.

Often when we specify your goods from dealers, they say they are out of yours and send what they have on hand, and I prefer to get goods that are recommended as highly as yours.

Yours truly,
W. C. WOLFE,
Monroe, Union Co., N. C

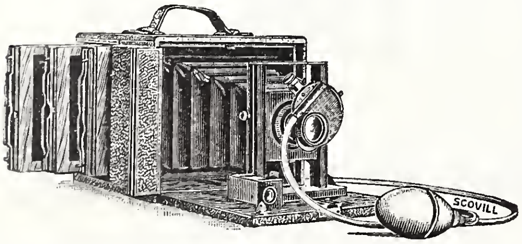
We make Double Refined Chemicals for Photographers, as well as Walpole Hypo—purest Hypo made.

☞ We do not solicit retail trade. Where consumers cannot obtain our products from their usual sources of supply, we will furnish them on application ; but it must be understood that in these cases we charge the full retail prices, and that cash must accompany the order.

Send 5 cents (stamps) for each sample or 25 cents (stamps) for 6 samples.

WALPOLE CHEMICAL COMPANY, Walpole, Mass.
G. GENNERT, EASTERN AND SOUTHERN SELLING AGENTS.

The Henry Clay, Jr.



Partly owing to the march of progress, and partly to the present tight state of the money market, there has long been a demand for a hand camera which should possess all the necessary requirements for good work, but at the same time be obtainable at a reasonably moderate price. That we have successfully met this with our new Henry Clay Junior camera we think all will readily admit on seeing that apparatus. The superb workmanship of the Henry Clay camera is too well known to require any description from us, and we have only to say that, notwithstanding the considerable reduction in the price of the new camera, the finish is in almost every way equal. The Henry Clay Junior is now made in the two sizes, 4 x 5 and 5 x 7, and differs from the ordinary camera of these dimensions in certain points which we shall specify. It contains space for three holders, or six plates. A novel arrangement has been added by which the holders can be slipped into place without the usual inconvenience attached to such proceeding. The lens is a perfect little beauty, and does very fine work. The front portion has a sliding up and down movement for the lens, but no swing ; indeed, with a hand camera this is but very rarely necessary, such objects that require it are best left alone with small cameras. The camera front can be fitted into position with the greatest ease. The movement is the work of a second ; by pressing the catch the front of the box falls down, a piece of brass is caught hold of, the camera comes forward to the scale and, with one-quarter turn, it is fixed as firmly as a rock into position The instrument is fitted with revolving diaphragms, reversible finder and an admirable little shutter, which can be used for time or instantaneous work. When closed the dimensions of the 4 x 5 camera are 5¾ x 7 x 6, including space for three holders. Altogether we can thoroughly recommend this instrument to all who require a first-class camera at a moderate price.

It is manufactured in the works of the famous

AMERICAN OPTICAL COMPANY.

Price, 4 x 5 size, $30.00, Price, 5 x 7 size, $38.00.

Including One Double Plate Holder.

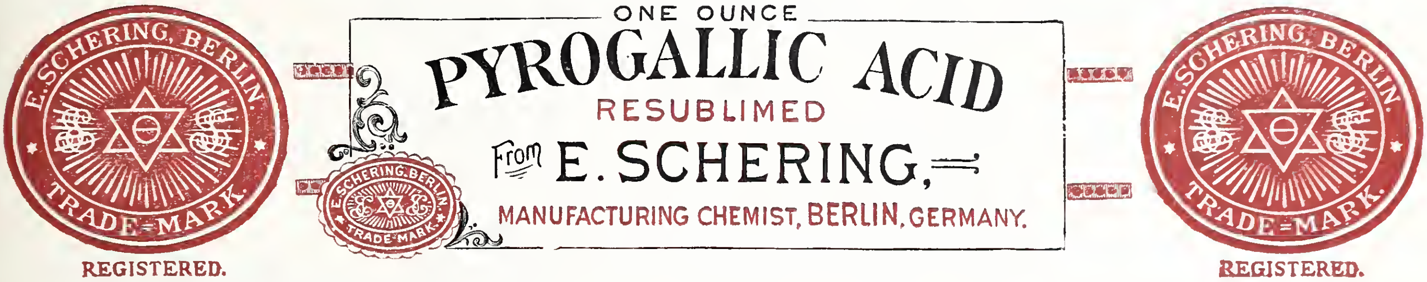
Extra Holders for 4 x 5 size, $1.25 each. Extra Holders for 5 x 7 size, $1.30 each.

FOR SALE BY ALL DEALERS AND

THE SCOVILL & ADAMS CO. OF N. Y.

When purchasing a Developer please be particular to specify **Schering's** the oldest and most favorably known brand.

Put up with labels and seals as per fac-similes here given.



THE STANDARD OF THE LAST—THIRD—EDITION OF THE GERMAN PHARMACOPŒIA.

See that you get the Genuine "Schering's." Excelled by none.

Send Orders to your Dealers, or to

THE SCOVILL & ADAMS COMPANY, NEW YORK.

Remember

THAT

"Three Crown"

Albumen Paper

Is absolutely the BEST.

WHY?

Because none but the Best of the Rives Paper is selected for Albumenizing the THREE CROWN BRAND.

It is therefore free from the imperfections often to be found in other brands, which arise from defects in the plain paper, and hence cannot be avoided.

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The American Optical Company's Apparatus

FINEST IN THE WORLD.

Swift, Steinheil and Zeiss (Imported) Lenses

ACKNOWLEDGED TO BE THE BEST.

Gundlach, Bausch & Lomb, and "Waterbury" (Domestic) Lenses

WITHOUT RIVALS IN POPULARITY.

Morrison Celebrated Wide-Angle Lenses

THE BEST IN THE WORLD.

"Three Crown" Albumen Paper

ABSOLUTELY WITHOUT FAULTS OR BLEMISHES.

Waterbury Cardboard

THE UNEXCELLED.

Merck's Superior Pyro, Andresen's (and Hauff's) Amidol, and Andresen's Sulphite of Soda

Prepared Developers

AND OTHER SOLUTIONS, READY FOR USE.

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Wuestner's Orthochromatic "Imperial" Non-Halation and E. E. (Eagle Equitorial) Plates

THE VERY LATEST.

The New Columbian Developer

FOR UNDER-EXPOSED AND VERY RAPID PLATES.

Woodbury's Antipyr

FOR HARDENING GELATINE NEGATIVES AND PRINTS.

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Our Lenses are BETTER than ANY European product you may doubt us.

If we say

Our Lenses are as GOOD as the BEST you MAY believe us.

If we say

Compare our Lenses with those which YOU consider BEST, we secure your confidence.

Therefore we say

We make every variety of Lenses. When you contemplate buying, ask for one of OURS to compare with OTHERS. We give you a Test=Chart for this purpose. If OURS is ONLY as GOOD and CHEAPER, you will keep it.

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NEW YORK CITY, N. Y.
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Improved Euryscopes

THESE are made in seven different series, for **all kinds of work** in the studio, outside, snap shots, interiors and copying. Positively excelling all other lenses in speed, definition, roundness, depth, and other desirable qualities so dear to every first-class artist. Used and highly endorsed by the leading professionals and amateurs of the world.

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Made, according to the Zeiss formulæ, by Voigtländer & Son.

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DARLOT LENSES **For Portraits, Views and Stereopticons**

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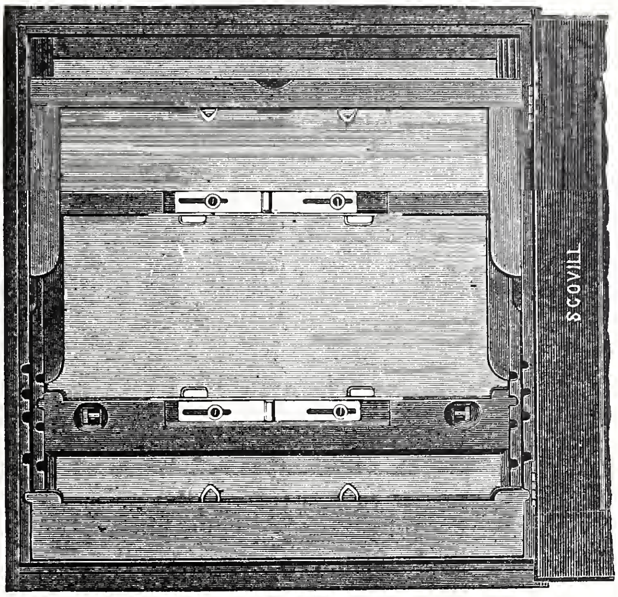
BOSTON, MASS.

The S. & A. Photo-Engraver's Adjustable Screen Plate Holder



[Patent applied for.]

This holder, as is shown in the cut above, is a great improvement over any heretofore manufactured for photo-engraving purposes. Its principal points of superiority are, briefly:

(First)—The ease with which it is adjusted for different size plates and screens, by a simple sliding movement of the two inside frames to or from the centre, and thus dispensing with the expensive and troublesome use of kit frames.

(Second)—The convenience by which the screen plate is accurately adjusted to the sensitized plate by means of the metallic sliding adjusters. (Heretofore it has been necessary to do the adjusting by means of inserting different thicknesses of cardboard, paper, etc.)

(Third)—Different thicknesses in the screen plates are allowed for by means of a spring which always holds the plate in accurate place no matter what its thickness may be.

(Fourth)—A graduated scale on each screen adjuster makes it easy to always insure absolute accuracy in determining the distance of the screen plate from the wet plate.

(Fifth)—The simplicity of construction and excellent workmanship of the entire holder, being made, as it is, in the factory of the famous American Optical Company.

And, altogether, it is an ingeniously designed and beautifully constructed holder which will be found of indispensable aid to the practical photographer.

These holders are thicker than the ordinary plate holders, and if it is desired to use them on a camera the ground glass of which is focused for the ordinary plate holder, a new ground glass frame is necessary in order to adjust the focus. When ordering a holder to fit a camera in use, send the old holder or the old ground glass frame so that the new ones can be made to fit the camera. Also state the size of largest and smallest screen plate to be used in holder.

It is made in various sizes. Prices as follows :—

		Frames *only*: for Ground Glass.
8 x 10 Size	$15 50	$1 50
10 x 12 "	21 00	1 50
11 x 14 "	26 50	1 88
14 x 17 "	29 00	2 25
17 x 20 "	32 50	2 63
18 x 22 "	36 00	2 63
20 x 24 "	40 75	3 00

If adjustment from the outside of holder is desired, add $2.00 to above prices.

Send for Our Complete Catalogue of Photo-Engravers' Supplies.

THE SCOVILL & ADAMS CO. OF N. Y.,

423 Broome Street, New York City.

DRESDEN PHOTO-PAPER WORKS

∴ ARE MANUFACTURERS OF ∴

CROSS-SWORDS

TRADE MARK. TRADE MARK.

DRESDEN EXTRA BRILLIANT ALBUMEN PAPER.

DRESDEN SATIN ALBUMEN PAPER.

DRESDEN KOSMOS COLLODION PAPER.

DRESDEN CELLOIDIN PAPER (BEST COLLODION.)

DRESDEN VIGILANT SENSITIZED PAPER.

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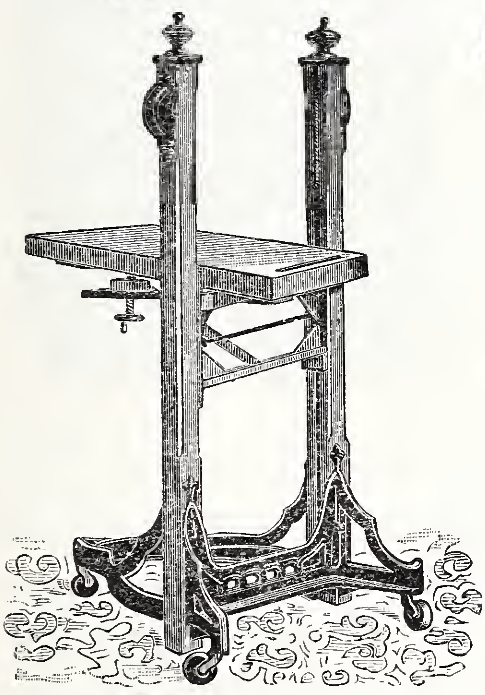

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THE ONLY ONE THAT GIVES PERFECT SATISFACTION.

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SOLE AGENTS,

34 Bromfield Street,
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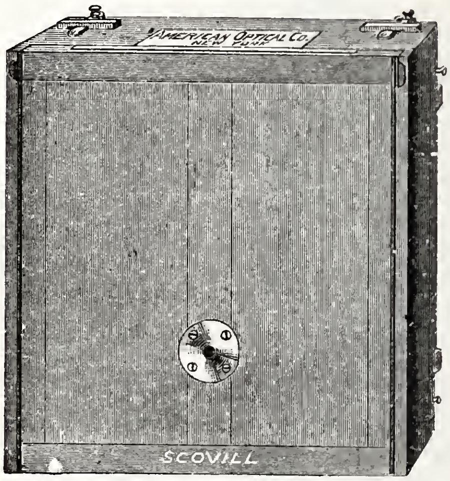
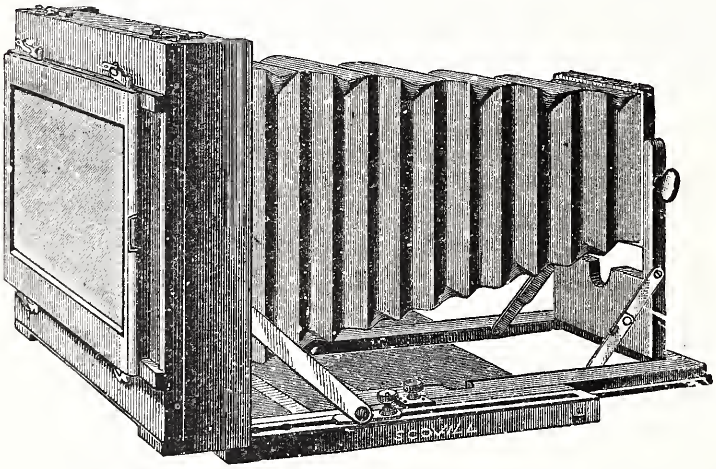
IRVING VIEW CAMERAS.

THE BEST LANDSCAPE CAMERA MADE.

The IRVING CAMERA was awarded the highest prize by the judges at the American Institute Fair. They expressed themselves as unable to see how a more complete, compact, light, handsome and serviceable camera could be made.

The IRVING CAMERAS all have swing front in addition to swing back, also vertical shifting front board, and can be focused with either the ordinary Rapid Rectilinear or the Wide-Angle Lenses. They have the Howe patent reversible back, fitted with self-locking ground-glass frame.


AMERICAN OPTICAL Co. NEW YORK
SCOVILL



One of the best features of the camera is the absence of detachable screws. An idea of this is conveyed by the illustrations showing the camera when extended and when folded.

A superb canvas case, the finest ever made, is supplied with each one of the IRVING VIEW CAMERAS.

Price List is as follows :

	Single Swing.	Double Swing.		Single Swing.	Double Swing.
4x 5 ..	$27.00	$32.00	10x12..	$60.00	$65.00
5x 7 ..	33.00	38.00	11x14..	65.00	70.00
5x 8 ..	35.00	40.00	14x17..	75.00	80.00
6½x8½..	40.00	45.00	17x20..	85.00	90.00
8x10 ..	45.00	50.00	18x22..	95.00	100.00

In order to convey an adequate idea of the lightness of these cameras, it is sufficient to say that the 5x8 size camera, with ground-glass in frame and holder, weighs only 3 lbs.

MANUFACTURED BY THE

AMERICAN OPTICAL CO.

FOR SALE BY ALL DEALERS.

Nepera Paper.

A NEW PRINTING-OUT, READY SENSITIZED PAPER.

IS neither CURLY nor HORNY, neither STICKY nor SOFT, but has a **rubber-like film,** which stands a hot water test of 100 degs. F. and behaves just as well in ice cold water. **NO ALUM** nor special hardening baths which endanger the durability of the image. **NO ICE, NO HOT WATER** treatment, no special negatives required. **PERMANENT PRINTS. A Paper for all climates and all seasons.**

THE ONLY AND PROPER SUBSTITUTE FOR ALBUMEN PAPER.

Gives Mat or Glossy Prints.

Our Bromide Trio.

PLATINOID, NEPERA BROMIDE!

Mat surface with Platinum effects. For contact prints and enlargements. Can be toned Sepia. Printed in a few seconds.

ENAMELED, NEPERA BROMIDE!!

Glossy surface. Can be burnished or squeegeed on Ferrotype plates. Resembles Albumen or Aristotype for large portraits.

ROUGH SURFACE. NEPERA BROMIDE!!!

A thoroughly first-class paper for crayon work, giving good blacks, pure whites and half-tones.

Nepera Bromide Emulsion is made by an improved process, insuring uniformity and rendering its manufacture entirely independent of condition of weather or quality of water.

Ask your dealer for **NEPERA PAPER** and **NEPERA BROMIDE,** if he does not keep them write directly to

NEPERA CHEMICAL CO.
NEPERA PARK, N. Y.

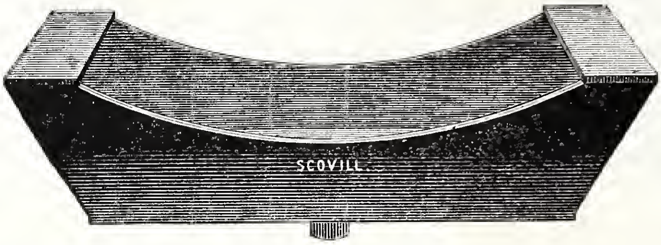
Use NEPERA-METOL-QUINOL CONCENTRATED DEVELOPER for Dry Plates and Bromide Paper.

One 8-oz. bottle will develop about 18 dozen of cabinet prints, - - -	$0 75
In powder, ready for use, to develop about 12 dozen cabinets (including postage), - - - - - - - - - - - - - -	50

To Photo-Engravers!

Having systematically undertaken the improvement of Engravers' Appliances, we follow the S. & A. Photo-Engravers' Adjustable Screen Plate Holder, and the S. & A. accurately adjusted Photo-Engraving Printing Frames, with the S. & A. Photo-Engraving Etching Tub, to which we call the attention of those interested in this business. We extend to them a cordial invitation to examine the same at our salesrooms.

These Photo-Engraving Etching Tubs will "fill a long felt want" with the photo-engravers, as they are constructed so as to resist the strongest acids, and combine the features suggested by practical experience.



The tub measures inside 48½ inches long, 20¼ inches wide, and 7⅝ inches deep, and the price of same is $10.00.

Very truly yours,

THE SCOVILL & ADAMS CO. OF N. Y.

Look out
for
imitations
of

WATERBURY

CARDBOARD.

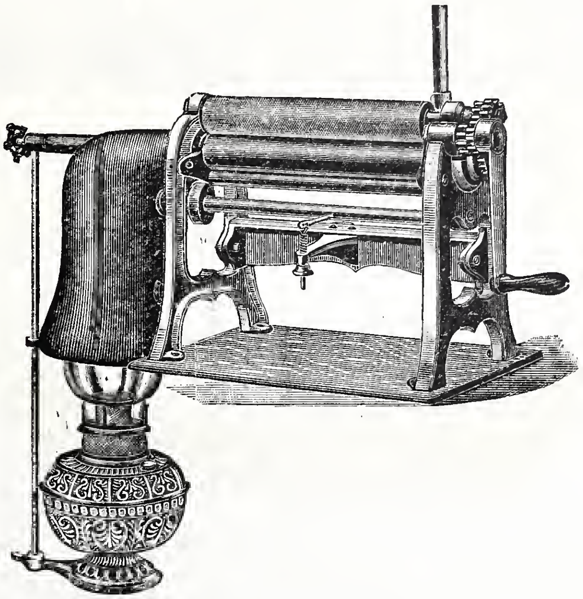
Look out
for the
genuine, too,
and see
that you
get it.

It is

the Best

and Cheapest.

Acme Burnishers



Newburg, N. Y., Jan. 28, 1895.

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Burnisher received. We are very much pleased with the new 15-inch roll oil-heating Burnisher. It has, after a thorough trial, given entire satisfaction. The lamp, as you stated, is very powerful and heats in very few minutes with the wick turned up but very little, and we find there is no danger of lamp smoking.

We are, very respectfully,

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This speaks for itself. Why?

Acme Aristo Burnisher gives the Best Gloss. Simplest in the world.

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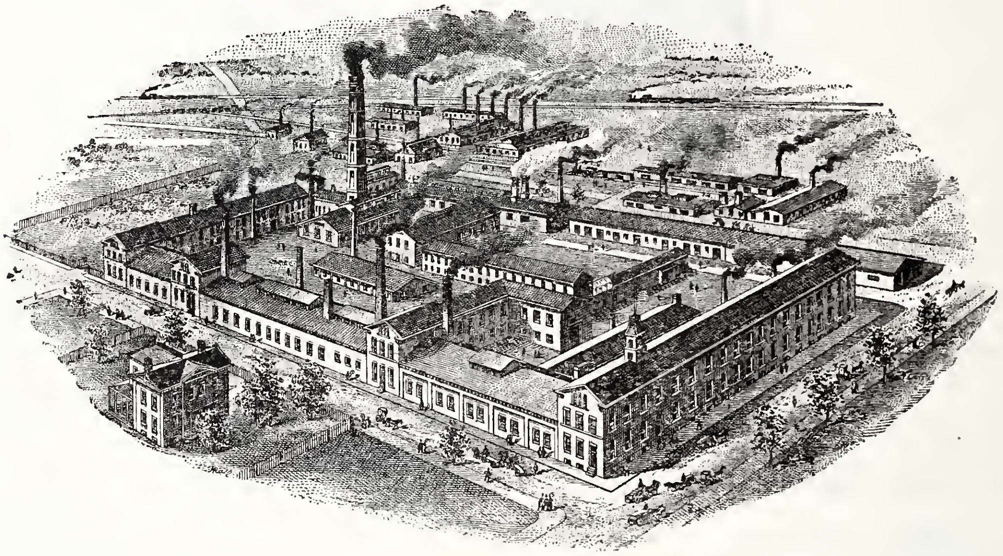

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SULPHITE SODA CRYSTALS AND GRANULAR. : : : : :
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COMMERCIAL AND CHEMICALLY PURE ACIDS, ETHERS
AQUA AMMONIA, SOLUBLE COTTON FOR COLLODION PAPER.

We Manufacture a full line of Chemicals,
Medicinal, and for the Arts and Technical purposes.

Bromo-Oxygen, a most efficient disinfectant and deodorizer. Can be diluted with 32 parts of water.

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CARDS FOR MOUNTING PHOTOGRAPHS.

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Against the Combine Trust and Dry Plate Manufacturers' Ring.

40 PER CENT. DISCOUNT

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WUESTNER'S REGULAR PLATES.

At the meeting just held in Cleveland, the Dry Plate Manufacturers' Ring devised a new scheme to boycott such Plates as would not submit to Ring dictation, by forcing combine brands of unknown manufacture and inferior quality upon the market, at such large discounts as they hope will lessen the sale of the "**Eagle.**"

We do not believe in such Trusts or Rings; much less will we be dictated to by them. We offer you the Best Plate on the face of the earth—"**The Eagle,**" an Anti-Combine Plate, which you can buy in case lots at 40% **Discount from Price List.**

Dozen in Case.	Size.	Regulars. 50 X, & 40 XXX.
39	3¼ x 4¼	$0.45
24	4 x 5	.65
24	4¼ x 5½	.75
28	4¼ x 6½	.90
22	4¾ x 6½	1.00
22	5 x 7	1.10
22	5 x 8	1.25
12	6½ x 8½	1.65
12	7 x 10	2.20
12	8 x 10	2.40
3	10 x 12	3.80
3	11 x 14	5.00
2	14 x 17	9.00
1	16 x 20	12.50
1	17 x 20	13.00
1	18 x 22	15.50
1	20 x 24	18.50

Prices on Orthochromatic Plates, Imperial Non-Halation Plates, Process Plates, Regular and Orthochromatic Stripping Plates and Lantern Slides Furnished on Application.

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OUR $\overset{40}{\mathrm{XXX}}$ PLATES

are used by seven-eighths of the View Photographers in the United States. Through our specialties we have gained the appreciation and thanks of professionals and authorities from all over the globe, and we have the testimonials to this effect, which no other manufacturer can boast of.

OUR ORTHOCHROMATIC PLATES

have no equal. They are the only true color value plates made in this or any other country; are guaranteed to keep for years, and are the only color value plates used by parties who make color work their business.

OUR IMPERIAL NON-HALATION PLATES.

are also Orthochromatic, and the only ones of their kind. Any one having once used them, will never try another. They are indispensible for interior work, and are superior to anything that was ever attempted in that line. The highest authorities in this as well as in many foreign countries, proclaim the plate to have no equal.

OUR E. E. (Eagle Equatorial) PLATES

are made for hot climates. They are the only rapid tropical plates ever made (as rapid as 50 Red X); they can stand boiling water without frilling.

OUR LANTERN SLIDES AND TRANSPARENCY PLATES

are at the head of the procession, while

OUR STRIPPING PLATES

are superior to any known in this country.

We guarantee you every plate, and will refund you any money paid, or replace any plate you may not be satisfied with.

In case your Dealer will not supply you, send your order direct to us, and we will fill it through a first-class house.

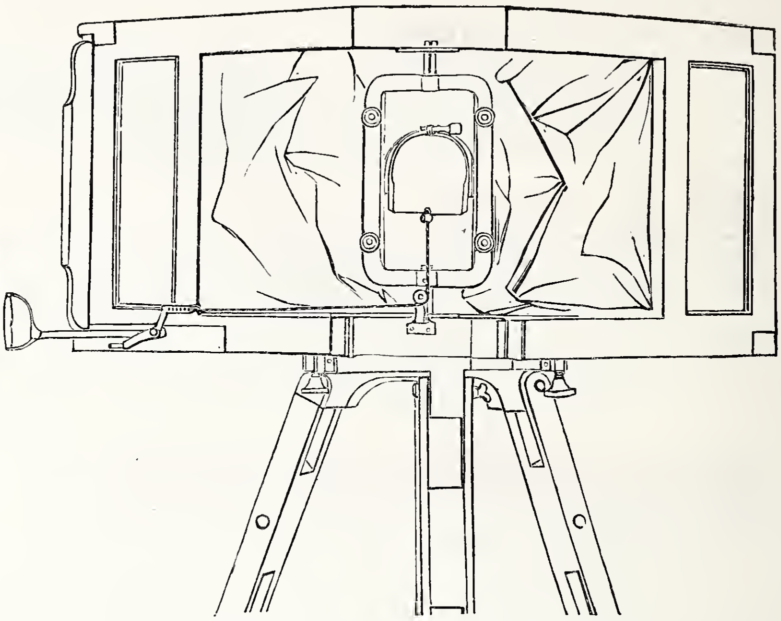
Respectfully,

WUESTNER'S NEW EAGLE DRY PLATE WORKS,

JACKSON PLACE, JERSEY CITY, N. J.

THE SCOVILL

Panoramic Camera.



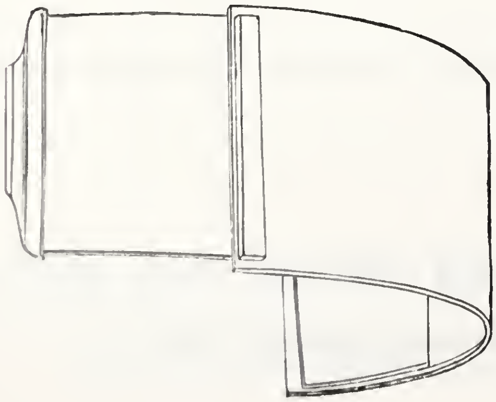
❧

WE take pleasure in introducing to the photographic fraternity our new Panoramic Camera, which is made in various dimensions up to the size capable of making photographs 18 x 48 inches.

A new design of constructing these cameras in hemispherical form has been invented; a new movement of crossing the lens over the segments of the circle, and an automatic release for the shutter has also been constructed. Carbutt's No. 27 films, or his orthochromatic films of the same sensitiveness, are used by means of an ingeniously constructed flexible dark slide, which permits of the necessary curve to conform with the back of the camera. The cameras are solidly and serviceably made, elegant in finish, and in every way maintain the world-wide reputation of the American Optical Company. The cuts shown herewith give an idea of the external appearance of the camera, and the dark slide for holding the film.

The prices of these cameras, including in each case a substantial wooden box or trunk for holding the instrument, a suitable tripod, a panoramic printing frame, two holders, two developing baths, and the celebrated Swift lens, are given below.

❧



Price of The Scovill Panoramic Outfit for making photographs 10 x 30 inches, complete as above, ...	$250
Price of The Scovill Panoramic Outfit for making photographs 16 x 43 inches, complete as above, ...	300

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METOL ✿ ✿ ✿
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WE HAVE OVER 1,000 TESTIMONIALS AS TO ITS BEING UNRESERVEDLY THE BEST

CONCEDED TO BE THE BEST PHOTOGRAPHIC DEVELOPER

Price per ounce 75c., per pound $10

Equal in strength to three times its weight in Pyro. Metol Cartridges for the traveler need only the addition of water. Price, per box of six making 90 ozs. developer, $1.20.

A ready solution of Metol Hauff (concentrated) the only satisfactory one-solution developer for the amateur. Made after the formula of the manufacturer, with Walpole New Process Chemicals. Price, per 8-oz. bottle making 25 ozs. developer, 35 cents; 16-oz. bottle, 50 ozs. developer, 60 cents.

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THE MOST PERFECT

Dry Plate . . . LAMP

PRICE $4.50

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Ready Sensitized, $1.50 gross.

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ESPECIALLY ADAPTED TO SHORT STUDIOS

ROSS BRITISH LENSES
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ROSS HAND CAMERA LENSES

JUST THE THING, F 5½ AT A LOW PRICE

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TWO NEW CAMERAS.

Scovill's New Waterbury.

The Best $15.00 Hand Camera in the Market.

A 4x5 Hand Camera,
with Three (3) Double Plate-holders,
An excellent Lens, and
New (Safety) Time and Instantaneous Shutter.
A very convenient Focusing Attachment, with
Indicating Plate on top,
View Finder, etc., etc.
Leather Covered.

All for $15.00.

Scovill's Henry Clay 2nd.

A 5x4 Folding Camera,
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An excellent Lens, with
New Safety Pneumatic Shutter,
Reversible View Finder,
Rising Front and Swing Front,
Leather Covered.

Best Folding Camera for the Money.

Price, complete, only $15.00.

Both Cameras made at the well-known works of

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FOR SALE BY ALL DEALERS.

Merit Rewarded at Last!

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Try the Paper we are making now, it is Perfection.

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Trade Agents: The Scovill & Adams Co. of N. Y.

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